SPRECKELS

SUGAR BEET

BULLETIN

Vol. 22 1958

AGRICULTURAL DEPARTMENT—SPRECKELS SUGAR COMPANY

Addresses and Telephone Numbers

NAME	TITLE	ADDRESS	TELEPHONE
SAN FRANCISCO STAFF			
Guy D. Manuel	*Vice-Pres. & Gen. Agriculturist*	SAN FRANCISCO *2 Pine Street*	*DOuglas 2-5600*
Hugh F. Melvin	*Agricultural Manager*	" "	" "
John M. Kendrick	*Assistant Agricultural Manager*	" "	" "
SPECIAL SERVICES STAFF			
Dr. Russell T. Johnson	*Director of Agricultural Research*	SPRECKELS	*GLenview 5-1811*
Austin A. Armer	*Agriultural Engineer*	WOODLAND	*MOhawk 2-3261*
Lauren Burtch	*Agronomist*	WOODLAND	" "
George W. Wheatley	*Agronomist*	SPRECKELS	*GLenview 5-1811*
S. L. Stovall	*Livestock Specialist*	SAN FRANCISCO *2 Pine Street*	*DOuglas 2-5600*
DISTRICT 1 STAFF			
Walter Buckingham	*District Manager*	SPRECKELS	*GLenview 5-1811*
J. Byron Larsen	*Agricultural Superintendent*	"	" "
James E. Gardiner	*Field Superintendent*	"	" "
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Tom F. Ryan	*District Engineer*	"	" "
Harvey W. Parker	*Field Superintendent*	KING CITY	*King City 602-J*
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Ralph S. Lambdin	*District Manager*	MANTECA	*TAlbot 3-3121*
Dan Dieter	*Agricultural Superintendent*	"	" "
S. S. Anderson	*Field Superintendent*	"	" "
Joseph W. Hull	*Field Superintendent*	"	" "
Stanley D. Bayer	*Assistant Field Superintendent*	"	" "
Ernest Moeller	*Field Superintendent*	PATTERSON *P. O. Box 928*	*TYler 2-2711*
John W. Bryan	*Field Superintendent*	WALNUT GROVE *P. O. Box 35*	*Walnut Grove 6-3371*
William Hurley	*Field Superintendent*	LOS BANOS *P. O. Box 928*	*Los Banos 4182*
R. Bruce Duncan	*Assistant Agric. Superintendent*	BAKERSFIELD *431 Kentucky Street*	*FAirview 4-4904*
Martin Chernek, Jr.	*Assistant Field Superintendent*	" "	" "
DISTRICT 3 STAFF			
Harry J. Venning, Jr.	*District Manager*	WOODLAND	*MOhawk 2-3261*
Donald R. Hefner	*Agricultural Superintendent*	"	" "
William Duckworth	*Field Superintendent*	"	" "
William Hodson	*Field Superintendent*	"	" "
W. B. Marcum	*Field Superintendent*	"	" "
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Virgil Horton	*Field Superintendent*	"	" "
Charles M. Carlson	*Assistant Field Superintendent*	"	" "
John O. Nielsen	*District Engineer*	SACRAMENTO *2641-5th Street*	*GIlbert 2-0449*
SPRECKELS SUGAR BEET BULLETIN			
Austin A. Armer	*Editor*	WOODLAND	*MOhawk 2-3261*

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SPRECKELS SUGAR BEET BULLETIN

VOL. 22 JANUARY-FEBRUARY, 1958 NO. 1

1

THE MOST SUGAR PER ACRE

is the objective of every sugar beet grower. Sugar per acre is the product of

TONS PER ACRE

X

PERCENT SUGAR

1957 approached an all-time record for high sugar per acre—despite low sugar percentages.

See page 2.

A WORD ABOUT SUGAR CONTENT

By GUY D. MANUEL,
Vice President and General Agriculturist,
Spreckels Sugar Company

WHAT ARE THE major factors influencing sugar content and can we do anything to modify or alter these factors in order to increase sugar content? These are difficult questions—only a few answers are known and experience is limited with others. However, there are some facts that are known and these are discussed here with the hope that something will evolve to reverse the downward trend of sugar content.

TEMPERATURE IS A FACTOR

Two of the most important factors influencing sugar content have been evaluated by Dr. Albert Ulrich of the University of California. The first of these, temperature and its effect upon sugar content, is generalized in Fig. 1. This curve shows sugar con-

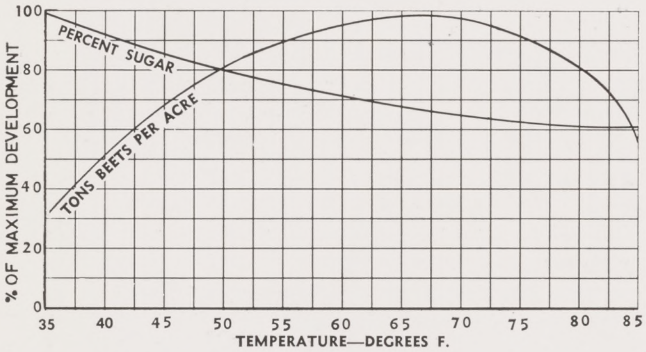

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Fig. 1. — TEMPERATURE affects both sugar content and tonnage. A mean constant temperature of 68° produced maximum tonnage, but at the expense of sugar content.

tent to be highest at lower temperatures and to be reduced as the temperature under which the beet is growing rises. It is easy to find many examples of this in actual field operations. Our records show that, historically, sugar content increases as harvest progresses during the fall in the Central Valley area of the state (dotted curves, Figs. 2 & 3). This rise in sugar content can be correlated quite closely with decreasing temperatures. In the Salinas Valley a slightly different condition exists because the cool July and August temperatures are followed by comparatively warmer September and October temperatures. The latter produces a downward curve of sugar content (dotted curve, Fig. 4).

Although we recognize that it is impossible to influence temperatures, the relationship between temperature and sugar content aids in explaining more exactly the other factors which influence sugar content.

NITROGEN IS A FACTOR

The second major factor is the level of nitrogen available to the plant. Fig. 5 shows the generalized effect of nitrogen on sugar content. As the amount of nitrogen available to the plant is increased, the sugar content falls. It should also be noted that on both Fig. 1 and Fig. 5 tonnage behaves just the opposite of sugar content. High temperatures (up to a

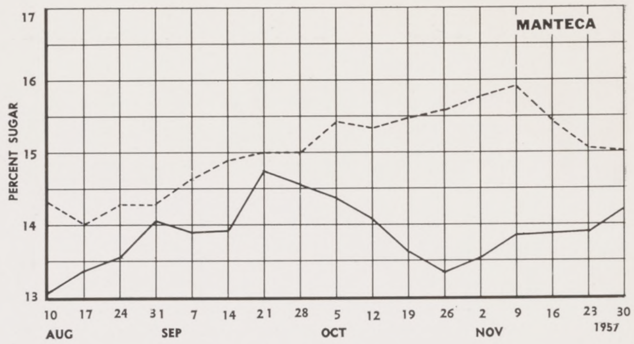

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Fig. 2. — DOTTED CURVE is 5 year average; percent sugar in Manteca district historically rises during fall months. Solid curve is for 1957; it followed the average until early rains started new growth and depressed sugar percentage.

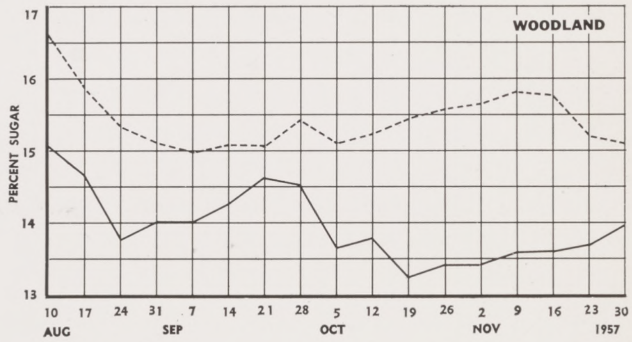

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Fig. 3. — DOTTED CURVE is 5 year average; percent sugar in Woodland District historically dips in early fall but recovers later. Solid curve is for 1957; early rains in September depressed sugar percentage but increased tonnages.

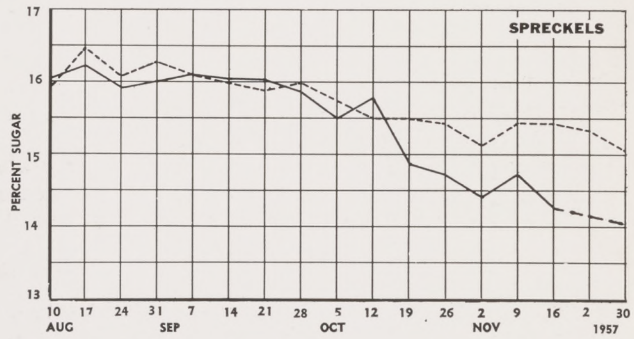

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Fig. 4. — DOTTED CURVE is 5 year average; percent sugar in Spreckels District historically falls throughout the fall. Solid curve is for 1957—fall rains caused lower-than-normal sugars, but sugar per acre broke all records because of high tonnage.

point) and high nitrogen application (also up to a point) tend to increase tonnage, while depressing the sugar content. To combine the influence of high temperatures and high nitrogen application can only mean low sugar content. Here is a situation wherein the grower can definitely influence the sugar content of his crop by not having both factors conspiring against him. He must avoid the excessive nitrogen applications which will depress sugar content at *any* given temperature level. The maximum returns to a grower will be obtained if the beet crop completely utilizes the available nitrogen in the soil two to three weeks prior to harvest.

INDEX TO VOL. 21, 1957

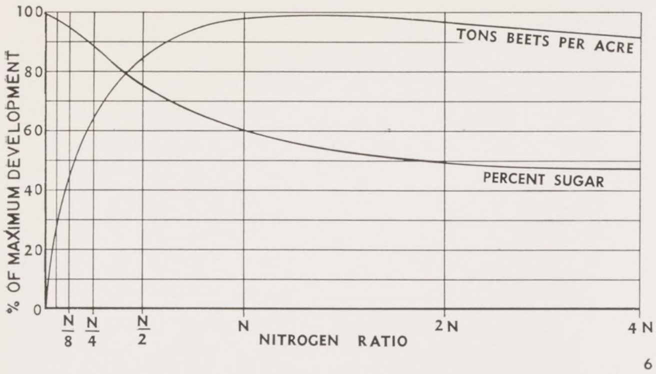


Fig. 5. — **NITROGEN is a factor in determining both tonnage and percent sugar. A little nitrogen is good—it increases yield greatly, but only slightly depresses percent sugar. But a lot of nitrogen is NOT good; percent sugar and tonnage both suffer.**

How to arrive at the amount of nitrogen to apply to a field in order to deplete the nitrogen supply by harvest is in itself a complex problem. The influence of previous crops and fertilizer practices must be considered as well as soil and moisture relationships, planting dates and the time at which the crop will be harvested. Resolving these factors and their interrelationships can only be obtained through a grower's experience on his own land over a period of years. Through rough experiments, such as strips where fertilizer is omitted and strips where the rate of fertilizer is doubled, growers can learn the response to different rates of fertilizer, and over a period of years come more closely to a proper rate. Using the old fallacy "if a little helps, a lot is better" can cost money both in wasted fertilizer and in decreased sugar content.

Two fields in the Salinas Valley were followed closely in 1957 and because of previous histories of low sugar content, fertilizer was not applied until the beets showed a definite need. Both fields grew high tonnages and sugar content was equal to or better than prior years. During the entire growing period no nitrogen deficiency was demonstrated. The growers made substantial savings in fertilizer costs alone.

VARIETY DIFFERENCES

Just what effect does the variety of sugar beets now being grown have on the downward trend in sugar content? In order to answer this question a study was made from all the variety plots we have run over a period of years. We believe that the results from this study are of interest. Fig. 6 shows the average sugar content of one variety, S-2, grown throughout all our districts over a six-year period. It is evident that there is a general downward trend. This trend coincides quite closely with the averages for all beets grown for the company. However, when one remembers that this variety is genetically constant through the years, it appears that the influence of environment—not heredity—must be the cause of the downward trend. It is important to note that the application rate of nitrogen per acre has generally been upward during this same period.

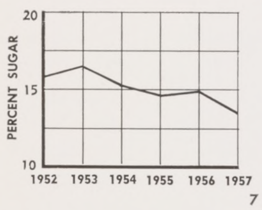


Fig. 6. — **PERCENT SUGAR from variety S-2 planted in all districts showed a downward trend over the past 6 years.**

Another approach to the variety and sugar content relationship is shown in Fig. 7. Each dot represents a separate experimental plot grown in commercial fields in 1956 and treated in exactly the same manner as the commercial crop. It can be readily seen that there is no relationship between yields and sugar content as both high and low sugar percentages are obtained at high and low yields. This graphically illustrates that factors other than variety have more effect on sugar percent than variety alone.

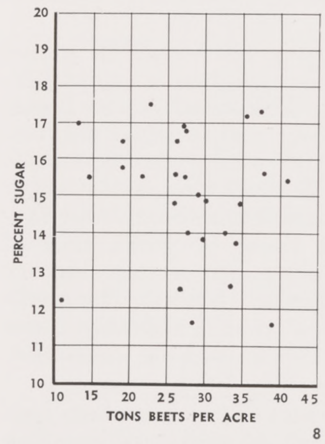


Fig. 7. — **EACH DOT represents percent sugar and tons per acre for a different experimental plot grown in 1956. There is no correlation between sugar percent and tonnage, proving that high tonnage does not necessarily mean low sugar.**

Closely related to this chart is another, Fig. 8, which shows the results of three varieties from three fields in the same area, all harvested at the same time. While there are differences between the three varieties shown, the differences between plots for any one variety are greater than the differences between varieties. This again illustrates that environment influences sugar percent more than variety.

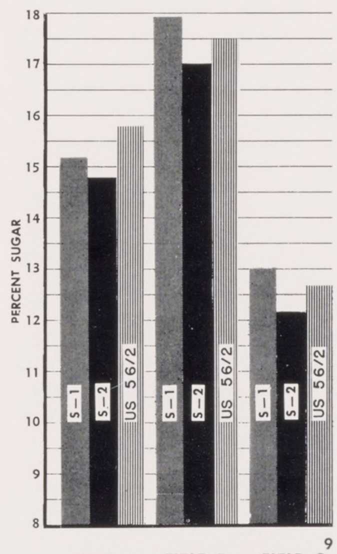


Fig. 8. — **SOME VARIETIES produce higher sugar than others. But the difference is small compared to the much larger differences produced by the environment in different locations.**

Thus it is important (if sugar content is to be increased) that proper environmental conditions are provided. Nitrogen level is the major factor which can be controlled by the grower, and best results can still be obtained where nitrogen is low at the time of harvest.

Although we have said that environment is the important factor, Fig. 9, page 8 is interesting because it shows the differences between varieties having different sugar content. U. S. 35 has always been higher in sugar content than other

(Continued on Page 8)

GEORGE P. WRIGHT TO RETIRE

THE PAST half century has witnessed vast changes in the beet sugar industry. No one can testify to this with greater authority than George P. Wright, who will retire on March 1 from the Agricultural Department of the Spreckels Sugar Company after almost 48 years in the industry, the last 39 of them with Spreckels.

Mr. Wright's career began in 1910 when he joined the Great Western Sugar Company as a field superintendent in Fort Collins, Colorado. A few years later he moved to California and worked for two beet sugar processors before joining the Spreckels organization in 1919. His first decade in the sugar industry was a period of expansion. Forty-four factories were erected during these 10 years, four of them in California, including Spreckels's factory at Manteca. This was the period that saw the traditional sugar barrel disappear from the grocery store and found beet sugar processors packing consumer-sized bags of sugar for the first time.

Mr. Wright's first job with Spreckels was field superintendent at San Rafael, 20 miles north of San Francisco. Today the Marin County fields that were planted to sugar beets 40 years ago are covered by suburban tracts and the runways of the Air Force's Hamilton Field Base.

In 1920 he was promoted to agricultural superintendent at Manteca and five years later was transferred to the company's newly-opened Sacramento-San Joaquin Valley district office at Sacramento. In 1937 he was made manager of that district, the same year that Spreckels's Woodland factory was completed.

It was during his service in the Sacramento-San Joaquin Valley that California's beet sugar industry faced its major threat from curly top. For a number of years this disease decimated field after field of sugar beets and seemed destined to remove the crop permanently from the state's agricultural economy. (Spreckels's Manteca factory, for example, had to be closed down in 1922-23 and 1925-31.) But due to the persistent efforts of Spreckels Sugar Company's entomologist, the late E. A. Schwing, aided by Mr. Wright and other members of the company's agricultural department, the breeding grounds of the beet leaf hopper, which carried the curly-top virus, were finally located in the dry hills of the west side of the San Joaquin Valley. These men instituted annual campaigns of spraying these hills to destroy the leafhoppers and their host plants. (Later, curly-top-resistant varieties of beet seeds were developed to give beet growers added protection against this disease.)

In addition to his anti-curly-top work, Mr. Wright was active in encouraging growers in the Sacramento-San Joaquin Valley to level their land, and adopt sound programs of irrigation, fertilization, and crop rotation. In the 22 years he was in that district the annual acreage contracted by Spreckels Sugar Company there grew from less than 10,000 to more than 50,000 acres. It was no coincidence that during this time California surpassed Colorado as the nation's leading producer of sugar beets.

Cooks Photo 10

GEORGE P. WRIGHT

In 1942 Mr. Wright moved to Spreckels as manager of the company's Salinas district. Once again he found the beet sugar industry faced with a threat to its survival. Before World War II, field labor was in abundance throughout California. But soon after Pearl Harbor agricultural workers virtually disappeared, thanks to the draft and the burgeoning defense industries. In these circumstances sugar beets were an expendable crop, since they required more field labor than other crops, particularly for harvesting. As a result, beet acreage fell off sharply. But, as it so often is, necessity was the mother of invention. The combined efforts of university, beet-sugar processors and government scientists and machinery manufacturers (notably the Blackwelders of Rio Vista) led to the production of the first commercial sugar beet harvesters. Mr. Wright and other Spreckels agriculturists spread the word about these machines, telling growers that their use would let them con-

tinue to raise beets. That the war-caused conversion to mechanical harvest turned out to be a boon is attested to by the fact that for the past few years almost all the state's sugar beet crop has been harvested this way.

In the past 10 years Mr. Wright has seen continued signs of progress in the beet sugar industry. Although comparatively few new factories have been built, many existing ones, including the three operated by Spreckels, have been extensively rebuilt and expanded in capacity. Agricultural research carried on by the processors, universities, and the government has resulted in the development of a host of new and improved beet seed varieties. Beet sugar processors formerly distributing but one product—granulated sugar— Spreckels and other beet sugar processors have diversified their offerings by offering liquid sugar, special grades of industrial sugars, and a full line of consumer sugars.

As George Wright retires from active participation in the beet sugar industry, he can look back on a half century of striking improvements in the methods and techniques employed in that industry. And he can surely take satisfaction from the fact that he has had a part to play in making not a few of these improvements come about.

THIS IS THE SEASON FOR INDUSTRY MEETINGS

MEMBERS OF THE Spreckels Sugar Company Agricultural Department have busied themselves during the past month in attending a series of meetings and conferences.

The purpose of these meetings and conferences is to further the efficiency of the beet sugar industry through the dissemination of knowledge in all fields of research which have a bearing on sugar beet agriculture.

The Spreckels Sugar Company Agricultural Department held its annual staff conference at Monterey, January 27 to 30. A comprehensive program, embodying all phases of sugar beet agriculture, was presented.

A portion of the program was made up of talks by specialists from public agencies. Those participating were:

Mr. George Geary
Assistant Chief—Farm Placement Service.

Dr. Francis E. Broadbent
Associate Professor of Soil Microbiology, U.C., Davis.

Mr. Robert E. Hanley
CFBF Legislative Representative.

Mr. Burton F. Alexander
Specialist, California State ASC Office.

Dr. T. R. Hedges
Professor of Agricultural Economics, U.C., Davis.

Lively discussions were held on subjects closely related to the day-by-day work of the staff. Individual members presented thoughtfully prepared papers, and the discussion that followed brought out worthwhile ideas. "Brainstorming" is a badly overworked word these days, but applies well to these constructive discussions.

An entire day was spent under the heading "Plant Breeder's Forum." Dr. Russell T. Johnson, Spreckels Director of Agricultural Research, led the discussion.

A roundtable on Mechanical Thinning brought out some constructive ideas on this important subject. In a nutshell—mechanical thinning is here to stay and will be used more and more as efficient field labor becomes scarcer.

Austin Armer, Spreckels Agricultural Engineer, presided at the 36th Annual Meeting, Pacific Coast Section, American Society of Agricultural Engineers, held on the campus at the University of California at Los Angeles. At the close of this two day meeting, Mr. Armer handed the gavel to the new section President, Professor Lloyd Lamouria of the University of California at Davis.

Several members of both the Agricultural and Operating Departments of Spreckels Sugar Company attended the 10th General Meeting of the American Society of Sugar Beet Technologists held at the Hotel Statler in Detroit, Michigan. Here again, Austin Armer presided and terminated his two year tenure as President of the Society when Mr. Harvey P. H. Johnson, General Agriculturalist, American Crystal Sugar Company, was elected President for the forthcoming 2 year term.

Attendance was slightly over 400 at this meeting and a wide range of technical subjects was presented and discussed. Simultaneous section meetings were

(Continued on Next Page)

THE AGRICULTURAL Department staff of Spreckels Sugar Company met at Monterey for their annual conference. 11

held. Subjects were: Agronomy; Genetics and Variety Improvement; Entomology and Plant Pathology; Agricultural Engineering; Chemistry and Factory Operation.

Newly elected officers in addition to President Harvey P. H. Johnson are: Vernal Jensen (Amalgamated Sugar Company), Vice President, and James H. Fischer, Secretary-Treasurer.

Spencer Photo 12

OVER 400 members of the American Society of Sugar Beet Technologists attended the opening general session of the Tenth General Meeting, held at Detroit, Michigan, February 4-7, 1958.

SPRINKLING SAVES BEET CROP

By R. H. DEARBORN
Field Engineer, W. R. Ames Company

ON A 136 ACRE planting of sugar beets near Dixon, Kie and Tudao Saito proved this last season that sprinkler irrigation can play a dramatic part in growing beets under difficult soil conditions.

No novices at beet growing, the Saito brothers systematically followed accepted cultural practices of land preparation, seeding, fertilizing and thinning. However, after the second irrigation by furrow method in late spring, the top growth of the beets wilted and started turning yellow. It was a discouraging sight.

The ground chosen for this year's crop was an exceptionally heavy clay loam soil having a very high waterholding capacity, a fairly high wilting point and poor drainage. Moreover, as the soil moisture was extracted by the plants and by surface evaporation, long cracks reaching 18 to 24 inches into the subsoil developed in the furrows. The second irrigation required an exceptionally large head of water to carry down the furrows, because the deep cracks in the soil robbed the furrows of their water. The consequence of this condition was that the water table throughout the field was raised to the point that the young beet roots were in saturated soil that drained very slowly. When inspection of the beets was made as the tops wilted, it was found that the tips of many beets were rotting.

The Saito brothers solicited the aid of Spreckels Field Superintendent Virgil Horton, The Ben Barrow Company of Woodland, (pump and sprinkler dealer), and the W. R. Ames Company field engineer. Investment in a sprinkler system was calculated to be a reasonable risk, and an Ames sprinkler system was designed to meet the crop and soil needs.

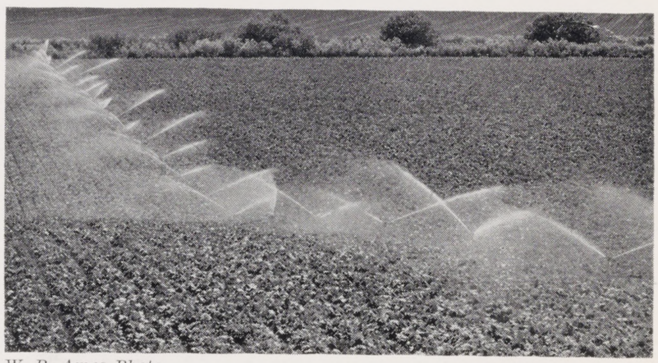
A "TAILORED" SYSTEM

It was first determined that a slow application rate of approximately .30 inches per hour which would fall in small droplets and not disturb the tilth of the field was desirable. A sprinkler was chosen with single 5/32 inch nozzles operating at 45 p.s.i. pressure (supplied by a pump driven from the power

Ben Barrow Photo 13

KIE SAITO holds two beets which demonstrate the difference between sprinkler and furrow irrigation. Fig. 2, page 7, shows this contrast.

Fig. 1. SPRINKLER IRRIGATION demonstrated a striking improvement over furrow irrigation in the case of sugar beets planted in very heavy soil with a high water table.



W. R. Ames Photo 14

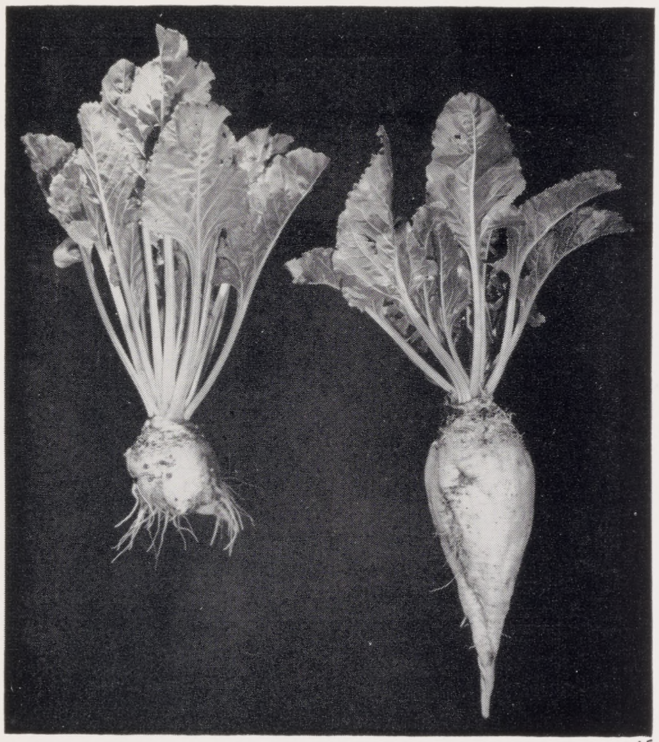


Fig. 2. LEFT—a beet whose root was rotted away by standing water, but which survived after changing from furrow to sprinkler irrigation.

RIGHT—a beet from the same field, but which had only sprinkler irrigation.

take-off of a tractor). Discharge was approximately 4.7 g.p.m., and at a setting of 30 feet between sprinklers on the lateral line with a 50 foot move of the line after each setting, a coefficient of uniformity of approximately 86% was obtained. This gave an excellent coverage. There was no crusting of the ground from the irrigation, the tilth was not destroyed and cracking of the soil was all but eliminated.

It was further determined that each application of water would be limited to the quantity required to replenish the soil moisture extracted by the plants in an 8 to 10 day period. This would vary according to climate and maturity of crop. It was estimated that the sugar beets would extract at peak demand approximately .22 inches per day in late summer. It was judged that the soil would have approximately 1.5 inches of readily available moisture per foot of depth and because of the high water table the crop was limited to the top 18 inches of soil. This meant an 8 to 10 day irrigation cycle had to be established to meet the peak needs of the crop.

The Ames system consisted of the necessary main supply line and 4 lateral sprinkler lines each 900 feet long made up of 3 inch by 30 foot pipe with mid-drain units. The 18 inch riser pipes were also at the mid point to facilitate handling the 30 foot sections. As each piece only weighed 25 pounds and was balanced at the center, two men were able to move the four lines within one hour's time, keeping two lines operating while the other two were being moved. This made it possible to make three sets per day for each line on an 8 hour schedule of 7-1/2 hours sprinkling and 1/2 hour moving. Each day an area 1850 feet x 300 feet or 11.3 acres was irrigated. Only six man hours of labor was required in every 24 hours of operation.

RESULTS WERE GRATIFYING

The results of the sprinkling program fully justified the investment. Whereas about five acres in the lowest part of the field had been irreparably damaged from water-logging, the remaining 131 acres recovered so well that a crop failure was converted into a profitable yield.

Beets which had badly rotted tap roots recovered; while they were small and sprangle-rooted (Fig. 2, Left) they contributed their share to the final yield. But most of the beets developed perfectly shaped roots (Fig. 2, Right). At the time of writing, 76 acres had been harvested, with a yield of 16.6 tons per acre at 16.8% sugar. A yield of 5580 pounds of sugar per acre was thus achieved on a crop which gave promise of complete failure—strong testimony to the suitability of a sprinkler system to the needs of this planting.

GOOD NEWS FOR BEET GROWERS

LATE IN DECEMBER the Department of Agriculture released the estimate of sugar to be consumed within the United States during 1958. The figure was set at 8,800,000 short tons, raw value. This is 175,000 tons less than the final figure for 1957. The reason for the decline in the figure is that the 1957 estimate was kept at a high level in order to insure adequate supplies.

Out of the 8,800,000 ton figure the domestic beet industry will receive a quota of 1,907,188 tons. Each beet sugar processor will receive a share of this total based upon a formula giving consideration to production and past marketings.

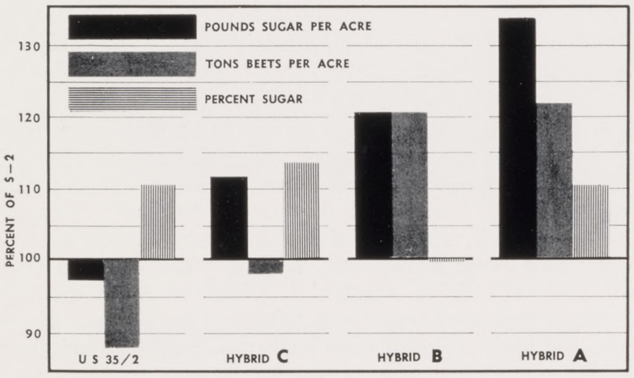
With the changes in the sugar act in 1956, the beet industry has already shown an increase of 109,000 tons over the old fixed figure of 1,800,000 tons. In addition, there is a good possibility of a Puerto Rican deficit again in 1958 that will give the beet processors a great portion of the total deliveries. The new act provides for domestic area deficits being given to other domestic areas first, and to foreign areas only if the domestic areas cannot provide the sugar. There is also a belief within the industry that final 1958 consumption will be higher than the 8,800,000 ton figure. This could not only give the beet industry its share of the increase but would increase the deficit of Puerto Rico which would be prorated to the other domestic areas.

While the marketings allowed the beet sugar industry in total will be down in 1958, the Spreckels Sugar Company will probably market more sugar in 1958 than in 1957.

SUGAR CONTENT

(Continued from Page 3)

varieties under any conditions, but has not had the ability to yield high tonnage; thus despite higher sugar content, the yield of sugar per acre has been lower than in other varieties. This has been true of all high sugar varieties. The bars in Fig. 9 compare U. S. 35

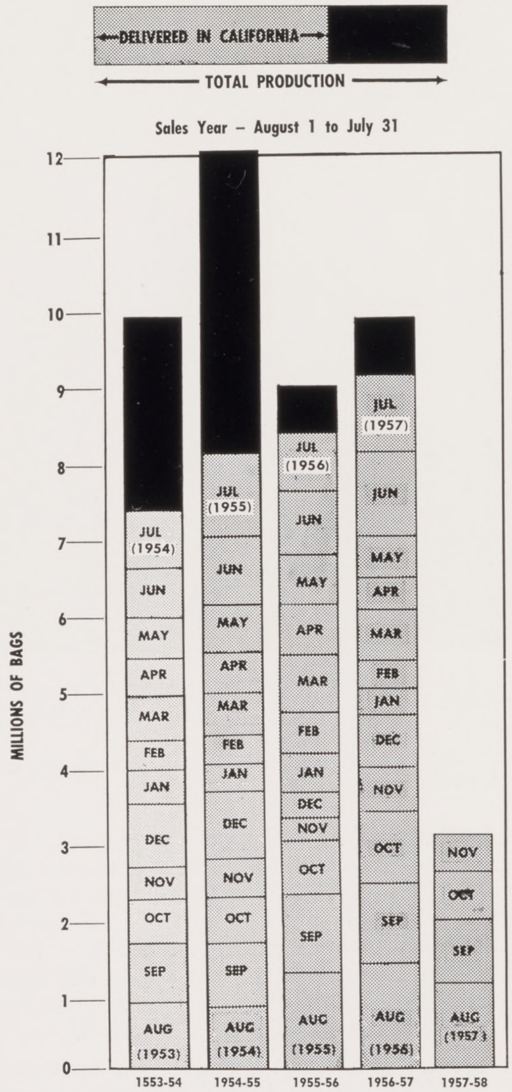


16

Fig. 9. — **MORE SUGAR PER ACRE** (black bars) is the plant breeder's aim, and it cannot be achieved with a high sugar variety like US 35/2. But hybrid varieties hold the key to higher sugar content (Hybrid C), higher tonnage (Hybrid B) and a combination of both (Hybrid A).

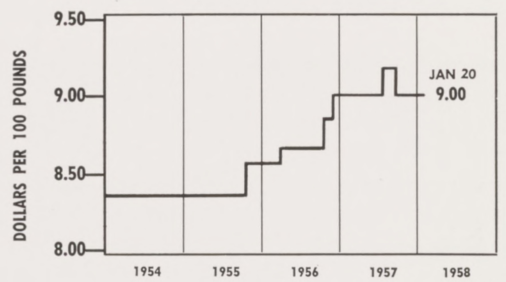
to our S-2 variety in sugar content, tonnage and sugar per acre. In addition, there are shown comparisons of three hybrids developed by our research department. Hybrid C shows a relationship somewhat similar to U. S. 35, with tonnage being lower as the sugar content is increased. But the decrease in tonnage is not as great as in U. S. 35, so that sugar per acre actually increases. Hybrid B shows a large increase in sugar content without any decrease in tonnage. Hybrid A now achieves the combination of both high sugar content and high tonnage, giving a large increase in sugar per acre. By the use of hybrids we now can successfully combine the two factors, and can look forward to higher sugar content in our future varieties. However, it still should be kept in mind that under the proper environmental conditions even hybrid A will have a greater sugar content than under adverse conditions. To be more specific, depleted available nitrogen at harvest time for any variety under any temperature conditions should produce maximum sugar content. It must be emphasized again that there are many more facets to high sugar than nitrogen and temperature alone. Best results are always obtained when the crop is kept in a thrifty and actively growing condition throughout the growing period.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR

In 100 Lb. Paper Bags, F.O.B. San Francisco



17

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All photographs by the editor unless otherwise indicated.

AUSTIN ARMER, Editor SPRECKELS SUGAR COMPANY WOODLAND, CALIFORNIA

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SPRECKELS SUGAR BEET BULLETIN

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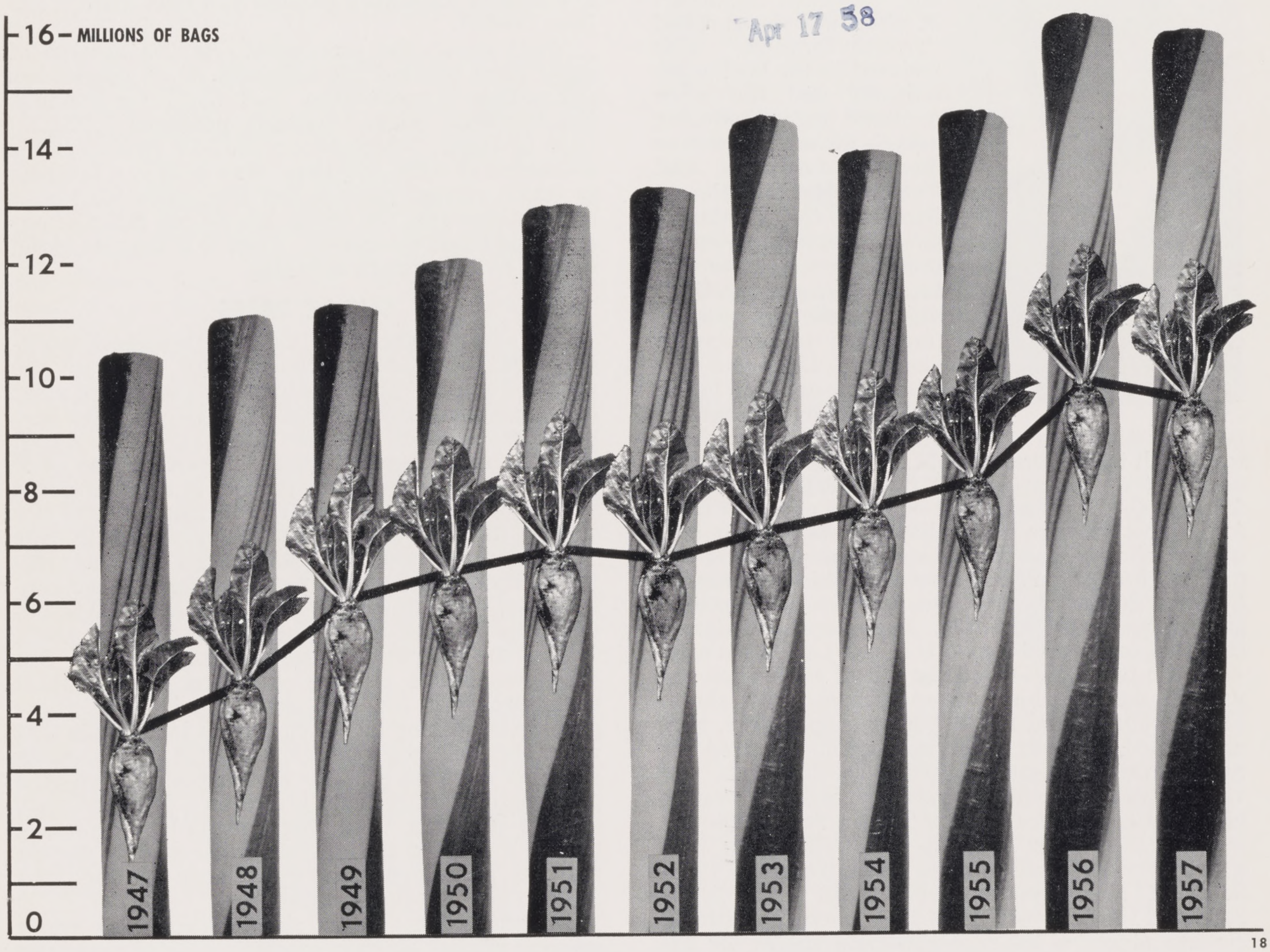


CALIFORNIA SUGAR DELIVERIES

have climbed steadily from 1947 to 1957 —

and an increasing share of this key market is being won by beet sugar.

GROWING DELIVERIES OF ALL SUGAR

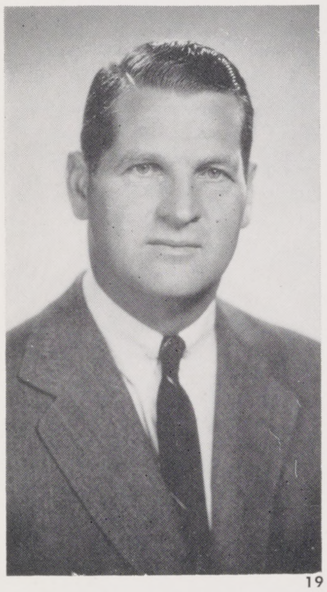
GROWING PERCENTAGE OF BEET SUGAR

are two factors which contribute to the benefit of the State's sugar beet growers and processors.

See page 10.

THE SUGAR ACT'S GROWTH FORMULA BENEFITS BOTH GROWERS AND PROCESSORS

By CHARLES DE BRETTEVILLE
President, Spreckels Sugar Company



19

WHEN CONGRESS extended the Sugar Act two years ago, it made several changes in that law, the most important of which was the so-called "growth formula." This restored to the beet sugar industry and the other domestic sugar-producing areas—the mainland cane area of Louisiana and Florida, Hawaii, Puerto Rico and the Virgin Islands—the right to maintain their respective historical shares of the U. S. sugar market by permitting them to participate along with Cuba and other foreign suppliers, in the rather steady increase in sugar consumption in this country. Now that we have lived with the growth formula for almost two years—now that we can measure it by hindsight as well as foresight—what can be said about its effect on California beet growers and California's beet-sugar processors who together produce over one-fourth of the nation's beet sugar? My answer to this question is: the growth formula has been good for *both* growers and processors in this state. More important, it will continue to be good for both of us. Let us see why.

In the fall of 1954 and the fall of 1955 when the national acreage objectives and proportionate shares for the 1955-56 and 1956-57 crops, respectively, were established, the beet sugar industry had a fixed annual marketing quota of 1,800,000 short tons, raw value, which it was not permitted to exceed. For each of those two crop years the national acreage objective was 850,000 acres. Of this total, California beet growers were allowed to plant 182,410 acres in 1955-56 and 182,530 acres in 1956-57. But in the fall of 1956 and the early winter of 1957 when the national acreage objective and proportionate shares for the 1957-58 crop were determined, the growth formula had been incorporated in the Sugar Act. This led to a significant increase both in the national acreage objective, which was finally set at 950,000 acres, and in the proportionate shares assigned to California, 206,041 acres. Partly as a result of unusually high yields from the 1957-58 crop, the national acreage objective for the 1958-59 crop has cut back to 915,000 acres and California's proportionate shares to 200,503 acres. But although both figures are slightly less than the corresponding figures for the 1957-58 crop, they are well above the pre-growth-formula 1955-56 and 1956-57 crop figures.

EFFECTS OF THE GROWTH FORMULA

Clearly, then, the growth formula has enabled California growers to plant greater acreages of sugar beets than they would have been able to plant if fixed marketing quotas for domestic sugar producers were still in effect. I hardly need mention that this increase in sugar beet acreage has occurred at a time when several other important California crops were either cut back through government control programs (cotton and rice) or suffering from depressed prices (tomatoes and barley). So, as a result of the growth formula, more sugar beet acreage has been available to the state's growers at a time when it has been needed.

What about the processors? As the acreage of sugar beets planted has increased, so, of course, has our volume of production. In 1956-57, for example, the Spreckels Sugar Company produced 3,700,000 bags of sugar; whereas our 1957-58 production is estimated at 4,600,000 bags. Now ours is a business in which volume plays a key role, since the longer our factories run, the better use we can make of our equipment and manpower. Thus it is that we stand to gain by the growth formula.

SUGAR SALES

How about sugar sales? Can the processors profitably sell the extra volume afforded them by the growth formula? This of course is a question of great importance to growers as well as to us, since the beet purchase contract specifies that a grower's return from his sugar beets depends in part on the price we receive for sugar. This price is to a great extent beyond our control. The New York spot price of raw sugar is the basic factor in refined prices of both cane and beet throughout the country, and this basic factor in turn is influenced by many forces—the consumption estimate set by the Secretary of Agriculture, the volume of production in offshore areas, strikes, the international situation, and so on. But there remains an element of control that the beet sugar processor can and does exercise over sugar prices: the seeking out of customers in markets that will yield the highest net return. This entails selling sugar as close as possible to the place where it is produced. For since sugar is sold on a delivered-price basis, a processor (and therefore its beet growers), receive a reduced return from sugar sold in distant markets in competition with sugar produced at points closer to those markets.

Fortunately, the California processors have had a growing market for their products close to home and have won for themselves a steadily increasing share of this market. There is every reason to believe, moreover, that this home market will continue to grow.

Our company's primary market is defined as the five western states of California, Oregon, Washington, Nevada and Arizona. In this area it receives the highest net return from its sugar sales. Of these states, California is by far the most important volume-wise, accounting in calendar 1957 for over three-fourths of the sugar consumed in the whole area. Let us examine a few figures to determine how successfully Spreckels and other beet processors have been

in marketing their sugar in this key market. This should let us make an informed guess about the profitability of marketing the increased quantities of sugar we should be able to sell in the future as the result of the growth formula.

HIGHER BEET SUGAR PERCENTAGE

Consider first total sugar consumption. (The candy-stick bars on the cover chart.) In 1947, 10,450,000 bags of sugar were consumed in California; in 1952, 13,283,000 bags; and in 1957 16,121,000 bags. This growth is accounted for largely by the increase in the state's population. Thus there were 10,194,000 people living here in 1947; 11,390,000 in 1952; and 13,922,000 people in 1957.

Now let us see how beet sugar sales in California have increased in the past decade (The sugar beets on the cover chart). In 1947 3,772,000 bags of beet sugar were sold here, or 36% of the total; in 1952, 6,475,000 bags, or 49% of the total; and in 1957 8,811,000 bags or 55% of the total.

What has caused this rather impressive increase in beet sugar's share of California's sugar market?

One factor is a negative one: the withdrawal of the Western Sugar Refinery, one of the two cane sugar refiners on the Pacific Coast, from the market in 1948. But this alone could not account for our gains; it had nothing at all to do with the progress registered in the last five years, for example. The rest of the explanation is that in the last 10 years the beet sugar industry has made a more effective sales effort.

Up through World War II the beet sugar industry did not do a very imaginative job of marketing its products. It made one grade of sugar—granulated—and offered it in various-sized bags weighing from five to 100 pounds. It left the consumer specialty market—powdered, brown, cubes and so on—to the cane refiners by default. And it did nothing to adapt its products to the specialized needs of industrial users.

All this has changed, of course. The major beet processors now offer a full line of consumer sugars and support them with vigorous advertising and merchandising programs. We make liquid sugars for canners and other users who prefer their sugar in this form. We deliver sugar in bulk to other industrial users. We make a variety of grades of industrial sugars to satisfy the various specialized needs of our customers. By such efforts we have been able to capture a sharply increased share of California's sugar market, both industrial and consumer, over the last decade until we now account for more than one of every two bags of sugar sold here.

THE FUTURE

It has been established that in California sugar consumption has been growing virtually without interruption, and that beet sugar processors have been gaining a greater share of this expanding home market. But what of the future? What are the prospects for sugar consumption in California in the next five or ten years?

The prospects are encouraging indeed. Every population expert concedes that the migration of people from other parts of the country to California will continue. And in the 1960's, when the state's large crop of war babies starts forming households, California's population should take another upward spurt. Thus there will be created heavier demand for sugar and sugar-containing products.

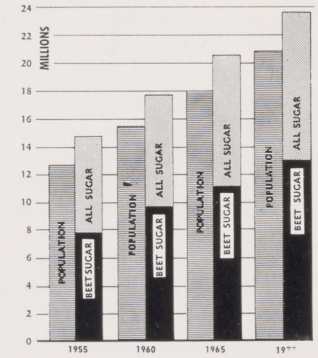
Nor is this all. In the last few years there has been a heavy influx of industry into California, including manufacturers of sugar-containing products. General Foods, Kraft Foods, Wrigley's, Life Savers, and Nestle's are among the many sugar users that have found it desirable to establish plants in California. If, as expected, other major industrial sugar users do likewise, another upward force on California's sugar consumption will be exerted. This force will be of particular importance to the beet sugar industry, since over the years we have enjoyed the greater share of the industrial market here.

The population of the country as a whole should also continue to rise. As this happens, the demand for sugar-containing products made only or predominantly in California—canned fruit, for instance—will rise. So the nation's growth, as well as the state's, promises increased sugar consumption in California.

These propositions can be illustrated with a few figures. The Stanford Research Institute estimates

POPULATION GROWTH in California will bring corresponding increases in sugar consumption, with beet sugar accounting for a growing share.

Beet sugar's share has grown from 36% in 1947 to 55% in 1957—the forecast in this chart is conservative, since it assumes no increase in this 55% share.



20

that California's population will be 15,629,000 in 1960; 18,059,000 in 1965; and 20,696,000 in 1970. During the 10-year period 1947-56 the state's annual per-capita consumption of sugar was 113.5 pounds. If this rate of consumption is maintained in the future, California's sugar requirements will be 17,739,000 bags in 1960; 20,497,000 bags in 1965; and 23,490,000 bags in 1970. If the beet sugar processors account for 55% of the state's sugar deliveries as we did in 1957, our sales here will be 9,756,000 bags in 1960; 11,273,000 bags in 1965; and 12,920,000 bags in 1970.

The foregoing evidence points to three conclusions:

1. We can indeed sell profitably the extra volume that will be made available to us under the growth formula.

2. The outlook for good returns from sugar beets is favorable.

3. The growth formula will remain a healthy stimulus to California beet growers and beet processors, as it already has proved to be in the short time since its incorporation in the Sugar Act.

SOME POINTERS ON THINNING

By AUSTIN ARMER

Agricultural Engineer, Spreckels Sugar Company

PAST ISSUES of the Sugar Beet Bulletin have carried numerous articles explaining how and why mechanical thinning can be used to advantage. The information failed to create an immediate change from hand to mechanical thinning among growers for Spreckels Sugar Company. But now the trend toward the machine is gathering momentum; we of the Spreckels Agricultural Department no longer feel obliged to stress the virtues of the machine. Instead, we feel that we must tell all we know about making the machine do a good job.

WHAT'S NEW IN THINNERS?

The two principle thinner manufacturers offer machines this year which have some pretty important improvements. They also have acquired a good deal of experience which their dealers and factory representatives can pass on to machine users to insure optimum operation.

The Silver Thinner is now offered for tractor toolbar mounting and power drive from the tractor rear axle. This is a marked improvement over the drawn machine. They also offer the double cutter head, which helps prevent tearing out blocks. (The first set of knives leave wide blocks—the second set is timed to split these into two equal small blocks.) For owners of the older pull-type machines, a kit may be had for direct mounting on most tractors.

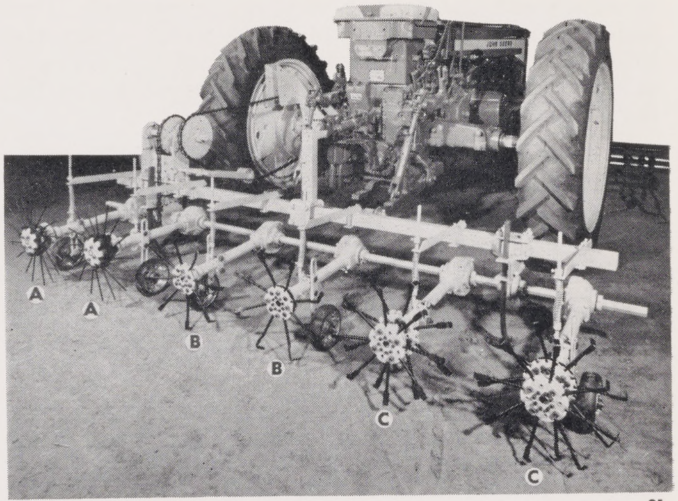
The Eversman Thinner retains its original patented features. The 45° angle of the cutter shaft produces a cut at right angles to the row; not slanting. A single cutter head carries 12 knives which can be turned to any desired angle to remove from zero to almost 100% of the row. A soft rubber (zero pressure) tire on the gage wheel runs directly on the beet row, causing the depth of cut to remain constant regardless of ground irregularities. Shields to protect adjacent rows from bombardment and covering by flying clods are a very desirable feature.

WHAT'S NEW IN THINNING METHODS?

At the Detroit Meeting of the American Society of Sugar Beet Technologists, a session on machine thinning brought out several important trends.

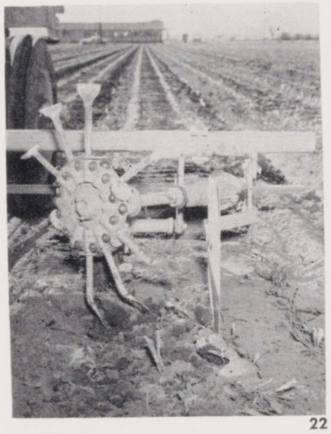
The "Twice Over System," accepted for years as the best way of using a mechanical thinner, is yielding to whatever system fits individual needs. A thinning machine can sometimes do its best work in one pass (the second pass tends to produce too many big gaps). Sometimes the finger weeder, or the wire brushes developed by John McDougall, may let the machines do its best work. Because of its infinitely adjustable knives, the Eversman thinner is basically a once-over machine.

The size of beet plants for best results with the machine has changed with experience. Marked improvement in results have been achieved by thinning when the plants are larger than previously thought to be the right size. The larger, better rooted top root is cut off cleanly, rather than being dragged. The remaining plants, being more firmly rooted and more vigorous in growth, are better able to resist the soil disturbance inherent to machine thinning.



Mile High Photo 21

THE SILVER thinner is now offered as a tractor-mounted, tractor-powered unit. A conversion kit for tractor-mounting the older drawn machines is also available. A, A—tine weeders. B, B—8-arm cutter. C, C—tandem cutters.



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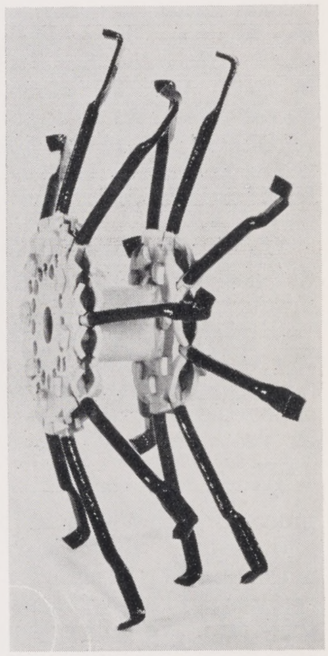
THE EVERSMAN thinner works in 2-row beds by taking all left hand rows from four beds in each of two passes. Shields prevent covering or damage of adjacent rows.

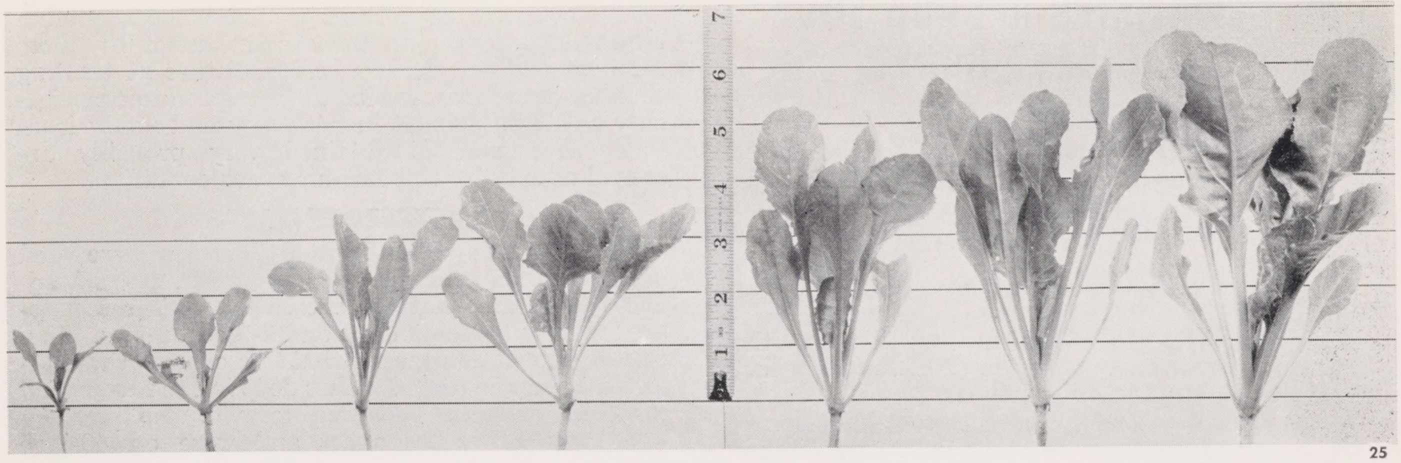


Mile High Photo 23

TANDEM CUTTER HEADS improve the Silver Thinner's performance.

24

OPERATING PROCEDURE for the Eversman thinner was explained by factory representatives in field demonstrations for Spreckels growers.



25

TOO SMALL — GOOD SIZE — TOO LARGE

THE PROPER SIZE of beet seedlings for mechanical thinning is four to five inches high (six to eight true leaves).

BLOCKING vs. THINNING

Probably the most persistent misunderstanding of how machine thinning works is the belief that the machine should duplicate the hoe-strokes of a man; that it should chop every thing out of 8 or 10 inches of row, leave a single plant, and chop out the next 8 or 10 inches. It should be obvious that there is a mighty slim chance of a single beet plant remaining at the very end of every 8 or 10 inch chop.

If a machine were set up to do this sort of blocking job its only chance of leaving even a poor stand would depend upon the original stand being a continuous, unbroken line of seedling plants, evenly spaced about an inch apart. Anyone who has looked twice at a field of prethinned beets knows that such a stand never exists. There are always clumps and gaps; there always will be, in spite of the promise of monogerm seed and better planters.

Now visualize the machine making *three* chops every ten inches, instead of one. Immediately the chances of leaving a single beet in ten inches have been tripled (and don't worry about leaving 3 beets in 10 inches—even if such an unlikely thing did happen, the extra beet or two would come out at hoeing time). Now the machine is thinning—not blocking. And that's just what it should do.

SLED-MOUNTED THINNERS

At least eight Spreckels growers have mounted thinning machines on furrow-following sleds. The sleds in use are KC, Collier, or home-made (see Spreckels Sugar Beet Bulletin, May-June, 1947). The thinners are Dixie, Eversman or Silver. Some very good results have been reported, because this type of sled not only keeps the thinners accurately on row, but provides uniformly level beds—a big help in machine thinning.

It is unfortunate that time did not permit obtaining photographs of these combinations—they hold much promise.

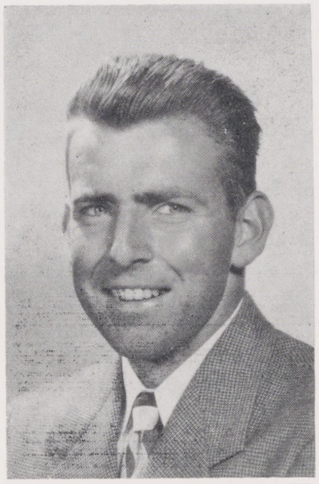
Notes From Our Field Men


26

J. E. GARDINER,
Salinas

"I have had several questions in my mind about stand counts for mechanical thinning especially where the original stand counts were on the borderline of being too thin.

"I believe in the past we have been trying to take out too many beets because of our concern over clumps and thickly populated areas in the rows. I believe we should try to end up with 150 beets in 100 feet on 2-row beds. Also, I have noticed that when we hoe after thinning, we are trying to dress up the rows too much; consequently, the hoeing costs go up."


27

E. B. MOELLER,
Manteca

"In my travels, I have observed very few pull-type thinning machines doing as good a job as tractor-mounted machines. Many growers who have rented pull-type machines have become discouraged with machine thinning, whereas other growers, who used tractor mounted thinners, have done a better job and have proved to themselves that mechanical thinning is practical.

"When I speak of pull-type thinning machines, I do not include the recently introduced sled-mounted machines. I believe these are very effective."

(Continued on Page 16)

DO NEMATODES REDUCE YOUR SUGAR BEET CROP?

By L. E. WARREN[1]

POOR GROWTH in many sugar beet fields can be traced to infestations of nematodes—microscopic worms that attack plant roots. Continued cropping to plants that will support these pests encourages their spread.

Nematodes of two different kinds attack sugar beets; one is the root-knot or garden nematode *(Meloidogyne spp.)*, which prefers lighter soils; the other is the sugar beet nematode *(Heterodera schactii)*, which is found in all soil types.

Sugar beets become infested with root-knot nematode beginning in early to midspring. The smaller roots will have knots of various sizes and the tap root will become sprangled. The sugar beet nematode also becomes active in midspring, eventually causing a hairy root of reduced size. At certain times small pearly white female nematodes containing eggs can be seen along the secondary roots. In the fall this egg sac becomes a brown cyst which is very resistant to adverse conditions and may exist for many years in the soil before a suitable host causes hatching.

Symptoms of the action of both species of nematode on the beets includes reduced top growth, some yellowing, wilting in afternoons, and, as the season progresses, death of many plants. The photograph shows that even complete loss of stand in large areas is possible. In addition to the direct action of the nematode on the beets, the areas of lesser beet growth will encourage weeds.

METHODS OF CONTROL

Rotation is used with some success but the known host range is so large that it is very difficult to grow crops that will not, either directly or through weeds, support these nematodes.

Successful chemical control of nematodes attacking sugar beets by the proper use of soil fumigants has been demonstrated as a result of experiments under a variety of conditions by Federal, State and industrial research organizations.

In present practice soil fumigants are deposited by means of chisels in lines at least 8 inches deep in soil that is near "seedbed" condition. A cultipacker is drawn behind the chisels to firm the soil and cover the chisel marks. Previously, little attention has been paid to the soil condition below the depth of the chisel, but it is evident that the extent to which a fumigant can move is dependent on the open spaces or "pores" in the soil, since most of the movement of these compounds is as a gas. If the soil moisture is high, or if a compacted layer is present below the depth of the chisels, a fumigant will not move downward to kill the nematodes much below this level. Although generally satisfactory results have been obtained by treating for root-knot nematode in the spring, occasionally poor control has resulted. Control of sugar beet nematode, usually in heavier soil, has been very erratic. Experiments have shown that an air space of 25 percent is about the minimum required for optimum nematode control by these fumigants. Since the high soil moisture at treating time in spring may reduce the air space to considerably below 20 percent in both clay and sandy loam soils, poor controls obtained very probably are caused mainly by this low air space condition.

EXPERIMENTAL

Two methods of fumigant application were used in the experiments described hereafter. Overall application means that the chemical was injected approximately 8 inches deep on 12-inch centers. Row or bed application means that the chemical was injected approximately 8 inches deep in the future seed rows only after the beds were formed. The beds had two rows 14 inches apart and were on 40-inch centers.

In order to avoid treatment in the high soil moisture such as is found in the spring, experiments have been applied in the fall after crops have depleted the soil moisture to about half field capacity. The plots were subsoiled two ways to a depth of 22 to 24 inches prior to treatment.

A field near the Spreckels factory at Woodland with sandy loam soil heavily infested with root-knot nematode was treated overall in November 1956. Visual results are indicated in Fig. 1, and quantitative results in Fig. 2. Spreckels S4 seed was planted about March 1, 1957.

Dow Chemical Co. Photo 28

Fig. 1. IN SOME REPLICATIONS of the experiments, where root-knot nematode infestation totally destroyed the untreated plots, Telone applied in November at 150 pounds per acre gave complete protection in the treated plots.

In this experiment, Telone[2] increased the yield in a field that would have been a complete loss to a yield highly profitable to the farmer. Other experiments have shown that profitable yield increases also can be obtained in fields with lighter nematode infestations. One of the few times sucrose percentages have been shown to be increased by treatment with a fumigant occurred in this experiment. It is believed that beets that grow under the stress of nematode

[1] Field Agriculturist, Agricultural Research, The Dow Chemical Company, Florin, California.

[2] The Dow Chemical Company Trademark for their 1, 3-dichloropropene soil fumigant.

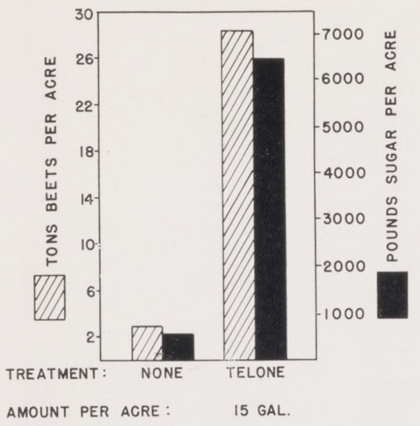


Fig. 2. CONTROL of root-knot nematode with fall treatment.

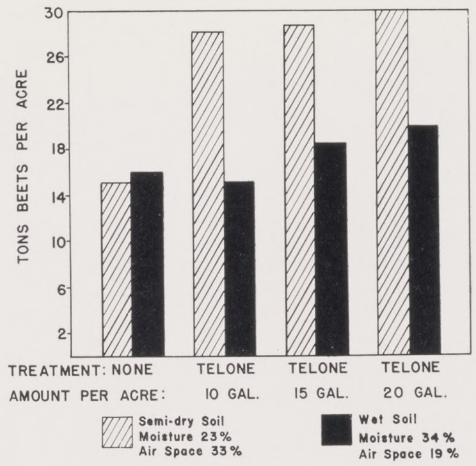
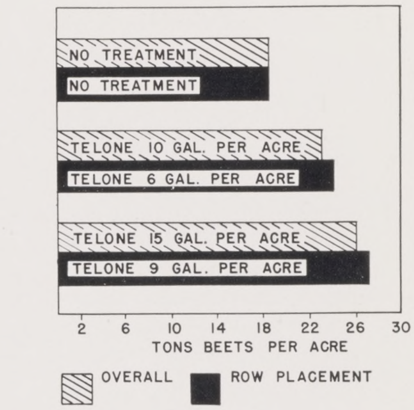


Fig. 3. EFFECT of wet and dry soil on control of sugar beet nematode.



29

Fig. 4. COMPARISON of row to overall treatment in control of root-knot nematode.

attack have less percent sucrose than healthy beets. The failure to discern this difference earlier may have been in the method of sampling, where very few infested beets were included in the sugar sample of untreated beets. The sucrose percentages were low here but were nearly equal to those of commercial beets being harvested nearby.

A field with silt loam soil near Tracy, heavily infested with sugar beet nematode, was treated overall with Telone in the fall of 1956. The soil moisture was at about half field capacity to a depth of 20 inches in two-thirds of the field; the other one-third had been flooded and was at or above field capacity. The moisture and air spaces for both sections of the field —wet and semi-dry—are shown in Fig. 3 along with the yields.

The soil that was wet and had a low air space at treatment produced much less tonnage than did the semi-dry soil with the same amount of Telone. This wet soil was representative of that found in most fields at planting time in the spring. As a result of this and other experiments it appears best to strive for a soil moisture of about half field capacity to a depth of 24 inches.

Aside from expecting better results by treating semi-dry soil in the fall, the grower would benefit also by avoiding the waiting period between treating and planting in the spring and by having one less operation at planting time.

Row placement of fumigants appear to give yields equal to those with overall treatments at a reduced cost to the grower. Fig. 4 shows the yields comparing overall versus row applications in a root-knot nematode infested sandy loam soil in March 1957. An 8-ton per acre increase was obtained with 15 gallons per acre of Telone applied overall, and a 9-ton increase was obtained with only 9 gallons per acre applied in the rows.

Naturally, the question of the results from bed treatment in connection with fall application arises. This seems to be practical since many growers prefer to form beds in the fall. In the event there is a weed problem, rotary hoes or similar devices or weed sprays can be used to keep the beds clean until planting time. It probably would be feasible to treat rows on flat ground in the fall if a small furrow or ridge were used to mark the center of the pass.

SUMMARY

In the experiments reported, fall applications of 15 gallons of Telone per acre applied overall in semi-dry soil controls both root-knot and sugar beet nematodes.

Row or bed placement of Telone was more economical than overall treatment. Poor results were obtained when the soil was too wet and air space too low at the time of treatment.

MEET NANCY HAVEN

Chet Brogan Photo 30

A NEW NANCY HAVEN is now singing the praises of beet sugar in California.

She is Miss Eleanor Artuso, a highly attractive native of Santa Barbara and a graduate of the University of California campus there.

As "Nancy Haven," the corporate name used by all regional home economists for Western Beet Sugar Producers, Inc., she will demonstrate beet sugar cookery on television, at schools, before women's groups and the like in the California-Arizona-Nevada region.

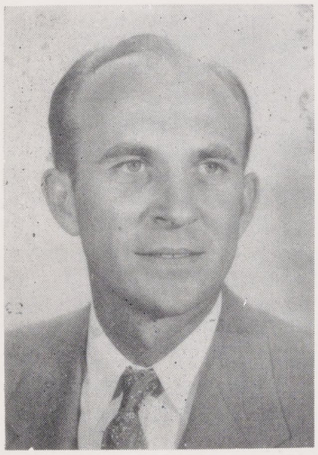
Miss Artuso replaces the former Miss Phyllis Kuckuck, who is now Mrs. Vertner Vergon.

The new Nancy Haven was graduated from Santa Barbara College with a degree in Home Economics. Via graduate work she also attained a California teaching credential.

After leaving college she went into professional home economics work, including service with public utilities, and as a result has both wide experience and a broad acquaintance with other home economists throughout her region.

Notes From Our Field Men

(Continued from Page 13)



31

S. S. ANDERSON,
Manteca

"My observations on mechanical thinning lead me to believe that we can do a good job only if we follow these rules:

1. Wait until the beets have from six to eight true leaves before starting any thinning work. We have been attempting to thin when the beets are too small.

2. Make pre - thinning stand counts, consult the thinning charts published by the machine manufacturers, and follow their recommendations even though the job being done doesn't look quite right.

3. Prepare the beet beds well at planting time. They should be even and flat on top, so the gauge wheels on the thinner have a smooth, even surface to run on.

4. Don't attempt to single clumps of beets at hoeing time, because then you are spending extra money which isn't necessary. Just cut out the weeds."

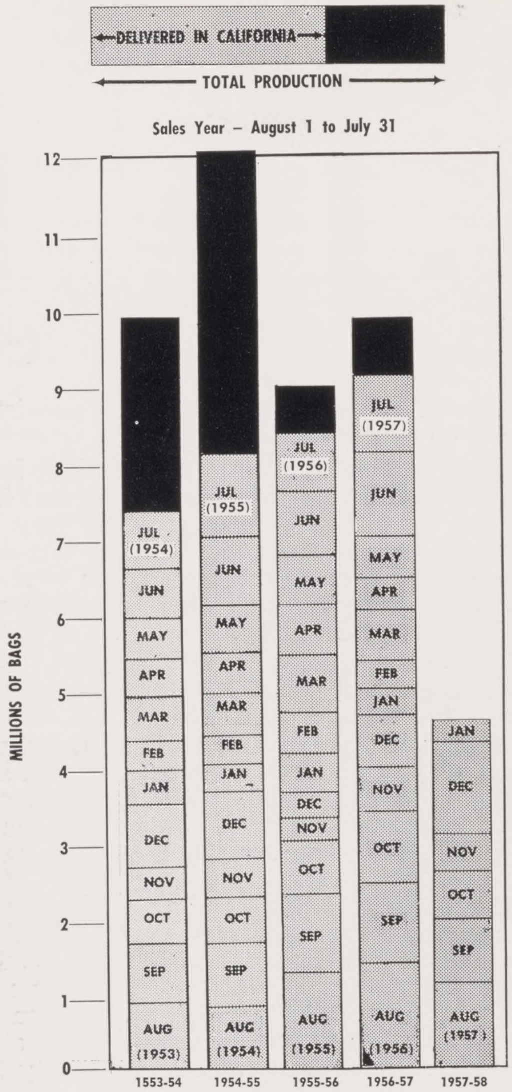
32

BRUCE DUNCAN
Bakersfield

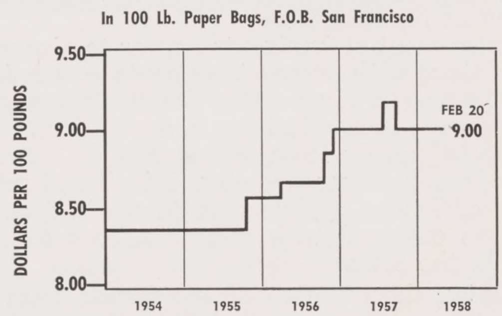
"A word or so must be spoken in defense of the trailer type thinning machine. These machines lend themselves very conveniently to being blamed for poor mechanical thinning jobs. It would appear as if such an appraisal of the machine is neither fair or correct.

"For one thing, there re trailer type Silver thinners available for rental and there are none of the direct mounted or three point hook ups in this category. A bird in the hand, etv."

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR



33

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All photographs by the editor unless otherwise indicated.

AUSTIN ARMER, Editor   SPRECKELS SUGAR COMPANY   WOODLAND, CALIFORNIA

PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

SPRECKELS SUGAR BEET BULLETIN

VOL. 22 MAY, JUNE, 1958 NO. 3

34

BUILDING BETTER BEET TRUCKS

is one way that growers are increasing sugar beet profits.

BIGGER PAYLOADS

FASTER UNLOADING

FEWER BREAKDOWNS

are some of the values offered by a well-built beet bed. Plans appear on pages 19, 20 and 21.

SPRING HARVEST

By GUY D. MANUEL

Vice President and General Agriculturist
Spreckels Sugar Company

WITH THE EXCEPTION of a few hundred acres, planted early last fall for this summer's harvest, the 1957 crop harvest is completed. The crop and the conditions of harvest were most unusual. A new record of production was established for the company, with bumper crops in every area except Kern County, which experienced the serious disease problems reported in the Vol. 21, No. 6 issue of this bulletin.

The fall harvest started in August with lower-than-usual sugar content, but it was expected to follow the normal pattern and gradually improve as the harvest progressed. However, a heavy rain near the end of September depressed sugar content even further and at the same time promoted rapid growth. As a result tonnage increased substantially, but sucrose content remained at a low level.

When in January—and then again in March and April—heavy rains were experienced, it was predicted that sugar content would remain low due to saturated soils and the lateness of spring harvest. Spring harvests of other years were generally characterized by a decline in sugar percentage after mid-April, yet mid-April was to be the start of harvest this year. The first beets harvested bore out these expectations—sugar percentages were low—many as low as 10%. But as harvest progressed sugar tests improved, contrary to predictions, and at the end of harvest, thirty-odd days after starting, the average was nearer 14%.

Accounting for this reversal in trend is mostly guesswork. But bolting was less and later than usual, and soils were drier at the termination of harvest. In all probability this year's sugar content trend resulted from a combination of factors including weather and improved varieties.

While a few growers plant expressly for spring harvest, it is the undoubted preference of most to complete harvest in the fall. In spite of this preference the spring operating period has benefited *all* growers. The assurance that factories will operate in the spring has permitted the average grower an estimated additional two weeks of highly favorable fall growth. By removing the necessity of having all beets harvested in the fall, regardless of wet, muddy conditions, harvest can start later with less concern for weather. Meanwhile, yields improve and in many instances sugar content increases beyond the level attained had earlier harvest been required. Additional expense of harvesting muddy fields can, for the most part, be eliminated and those beets over-wintered produce additional tonnages at little or no additional production expense. Growers can plant late in the season with confidence that growth will be made during the winter months if the crop does not progress sufficiently for harvest in the fall. Thus the spring operation has resulted in direct or indirect gains for all beet producers.

(Continued on Page 24)

DAMPING OFF - CAUSES AND CURES

By JOHN W. BRYAN

Field Superintendent, Spreckels Sugar Company

ONE OF THE major causes of seedling loss is the presence of soil borne fungi which produce disease commonly known as damping off, or black root. It is usually found as a darkened, withered area on the seedling root, and has been exceptionally prevalent this year.

CAUSES

The principal organisms causing the damage are *Pythium Ultimum, Pythium Aphanidermatum, Rhizoctonia Solani* and *Aphanomyces Cochlioides*, or Water Mold. One or more of these fungi are present in most irrigated soils, and may cause loss of stand under conditions favorable to its growth during the entire planting season. Seedling may be attacked at all stages of growth from germination until thinning stage, or even later. Most commonly, however, damage occurs just prior to, or soon after emergence.

The activity of the specific organism and the degree of damage is determined by several factors, among which are the following:

(1) *Soil Temperature and Moisture.*

Generally, there is less damage early in the Spring when temperatures are low. As the temperature increases, so does the activity of the damping off organisms, especially under warm, moist soil conditions.

(2) *Seedling Vigor.*

Rapidly growing seedlings have a great capacity to withstand and outgrow rather severe attacks of damping off fungi, while seedlings that are under stress of any kind succumb easily to the least amount of the disease that is present in the soil.

(3) *Effect of Continuous Irrigation.*

Land that is under continual irrigation with no dry crop in the rotation may become infested with fungi that cause damping off. The continuous presence of moisture in the soil favors the build-up of the organism.

CONTROL MEASURES

(1) *Contact Fungicides Used as Seed or Soil Row Treatment.*

Under normal conditions, fungicides such as Phygon, Ceresan, Captan, etc. give adequate control when applied to the seed as a spray or dust. Under severe conditions more complete protection is obtained by directing a spray or dust directly in the seed furrow at planting. New materials now in the testing stage show promise for complete control by virtue of the fact that they are partially systemic, that is, they attack the fungi from within the circulatory system of the plant.

(2) *Seed Bed and Fertility.*

Fast growing seedlings germinating in a moist, properly prepared seedbed have an excellent chance to outgrow all but the most severe amounts of damping off disease. A small amount of starter fertilizer, properly placed near the seed row ofter provides the "kick" necessary to get the seedlings off to a fast

(Continued on Page 24)

BUILDING A BEET BED

By AUSTIN ARMER
Agricultural Engineer, Spreckels Sugar Company

THE TRUCKS which haul sugar beets from the fields to the various Spreckels Receiving Stations represent a wide range of designs—some are well worked out with the convenience of the driver and the receiving station crew well considered, while others are deficient in these respects. So it may be of interest to look over some of the better designed trucks which arrive at our receiving stations, and to take note of the features which might be included in a composite, ideal design.

BASIC TYPES OF BEET BEDS

Ten or fifteen years ago, beet beds were constructed after a more or less standard pattern which was shown in the Spreckels Sugar Beet Bulletin for July-August, 1946. This design was brought up-to-date again in July of 1950, and reprints of this article with its working drawings may be had gratis by writing the Editor, Sugar Beet Bulletin, Spreckels Sugar Company, Woodland, Calif.

However, since 1950 there have been certain trends away from the old standard construction, principally in the direction of beet beds which can also serve as grain tanks, and which are readily installed on existing flat rack truck bodies. The construction details given in this article apply for the most part to this type of bed.

CONSTRUCTION DETAILS

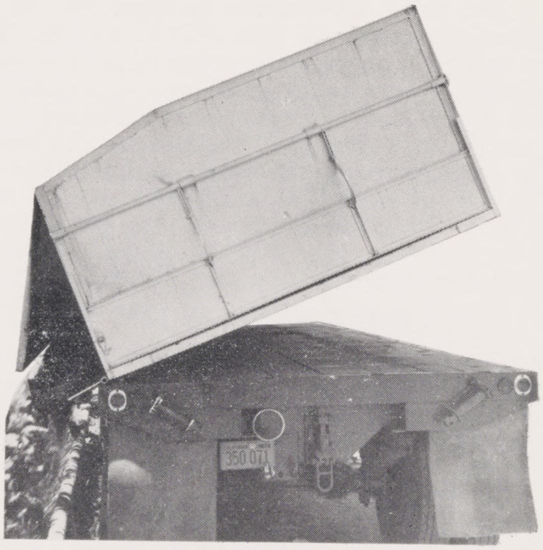
Basically, a beet bed consists merely of a box; open at the top, and with one of its sides hinged at the top so that it may swing outward as the box is tipped on its bottom corner.

The bottom, sides, front, and back are panels whose only function is to restrain the load of beets or other contents of the bed. In designing these panels, the objective should be maximum rigidity at minimum weight and minimum cost. While almost an infinite variety of panel constructions might be considered, there are three principal, practical types. The first, and perhaps the most desirable from an all-around standpoint is an all-steel construction, and a design for such a bed appears on the following pages.

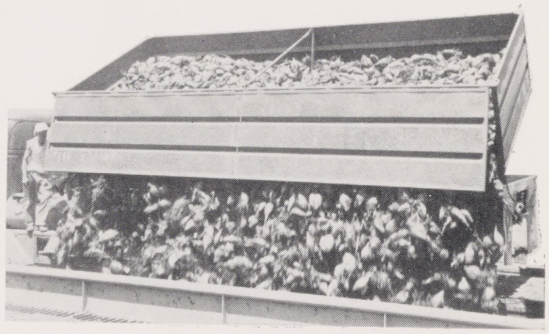
The next choice as a compromise between first cost and long life would be the old standard tongue-and-groove construction using boards 1¼″ thick stiffened with cleats.

(Continued on Next Page)

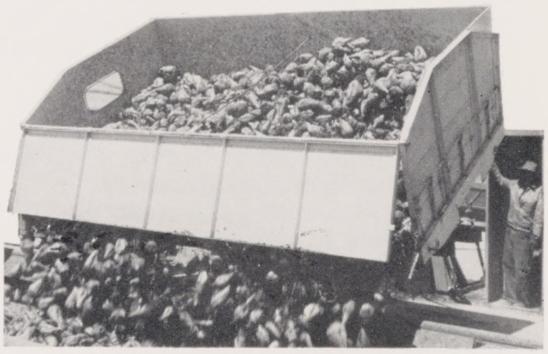
A BEET BED with a slide-gate at its end can be used for either beets or grain, and can also be easily detached from the truck's regular flat bed.



SHEET STEEL (12 gage), with lengthwise corrugations, was used by veteran Spreckels Grower Gene Winters of Woodland in making this bed. All construction was done in the farm shop except corrugating the panels, a job for a press brake (available in Sacramento, Rio Vista, Stockton, Salinas or Bakersfield).



PLYWOOD (⅝″, 5 ply waterproof "Plyform") with a suitable angle-iron frame work makes a light structure, but is less durable than sheet steel. However, it lends itself to farm-shop construction, and panels are easily replaced if damaged.



TWO STEEL BEDS are conveniently mounted on a single long flat rack semi. Beds like these—each about 16 feet long—lend themselves to mounting either as shown, or singly on bobtail trucks.

35

The third construction involves the use of waterproof plywood—the type used for concrete form construction and generally sold under the name "Plyform." When this material is used, a rather complete steel skeleton is required to surround and stiffen the plywood panels. Nevertheless, the construction is perhaps the least costly initially and is much lighter in weight as compared to the other two types. While its life may be the least of all, it has the advantage that worn or broken plywood panels may be replaced at low cost by an unskilled worker.

RIGHT HAND or LEFT HAND

Several years ago, the Spreckels Sugar Company standardized their receiving stations so that all trucks delivering beets in District 1 would dump to the driver's right side. These stations are Spreckels, Welby, Elsa, Soledad, Gilroy and Hollister.

At the same time, all other receiving stations (Sacramento and San Joaquin valley) were standardized to receive beets dumped to the driver's left side.

In building a beet bed, the location of the hinge and sling should correspond to the district in which the truck is to operate.

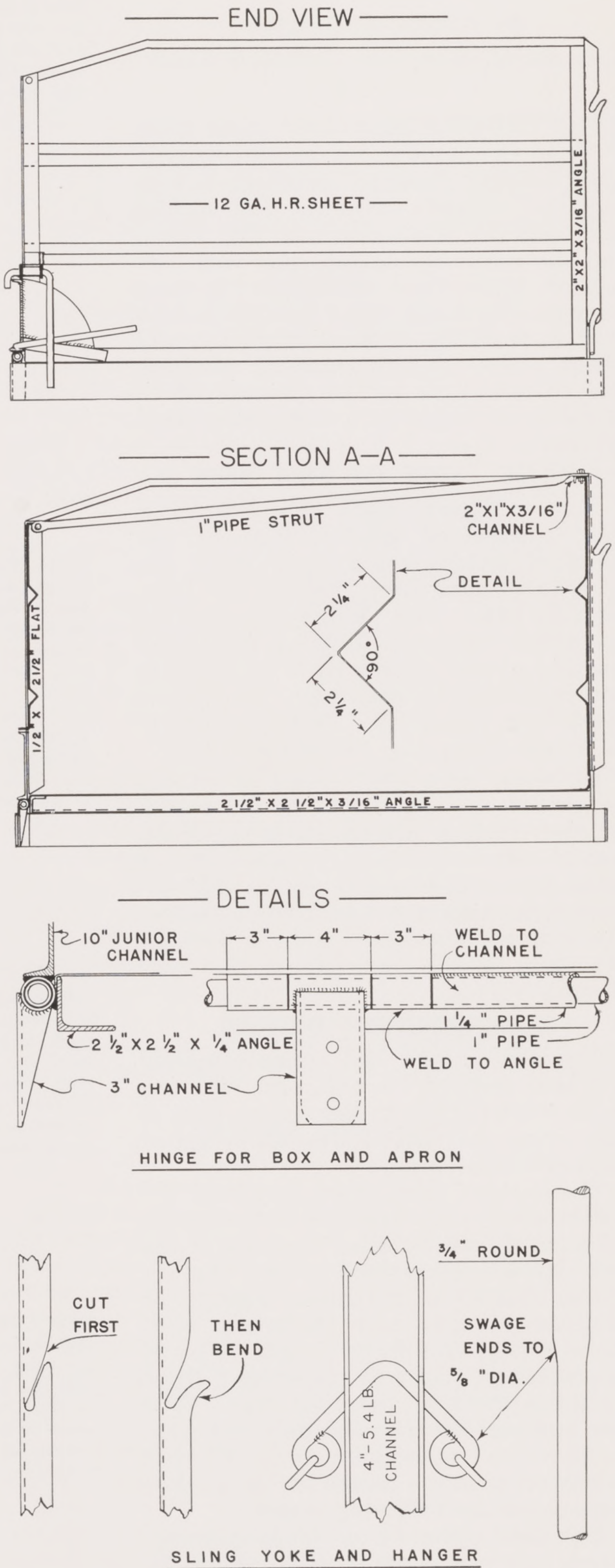
LEGAL ASPECTS

It is essential that the design of a beet bed be in accordance with the requirements of the California State Vehicle Code. As this code affects the construction of a beet bed, the outstanding requirements are:

1. Maximum width over all protruding members shall be no greater than 96 inches.
2. No part of the load may be permitted to fall from the vehicle.
3. Any vehicle (truck or trailer) first registered since January 1st, 1958, must be provided with approved electric turn indicators both front and back.
4. All vehicles used for hire shall bear the name of the hauling contractor.
5. All vehicles used in hauling beets should have facilities for night driving.
6. The distance from the center line of the steering wheel to the extreme left hand side of the vehicle or its load shall be not greater than 24″.
7. Flaps must be provided behind rear wheels.

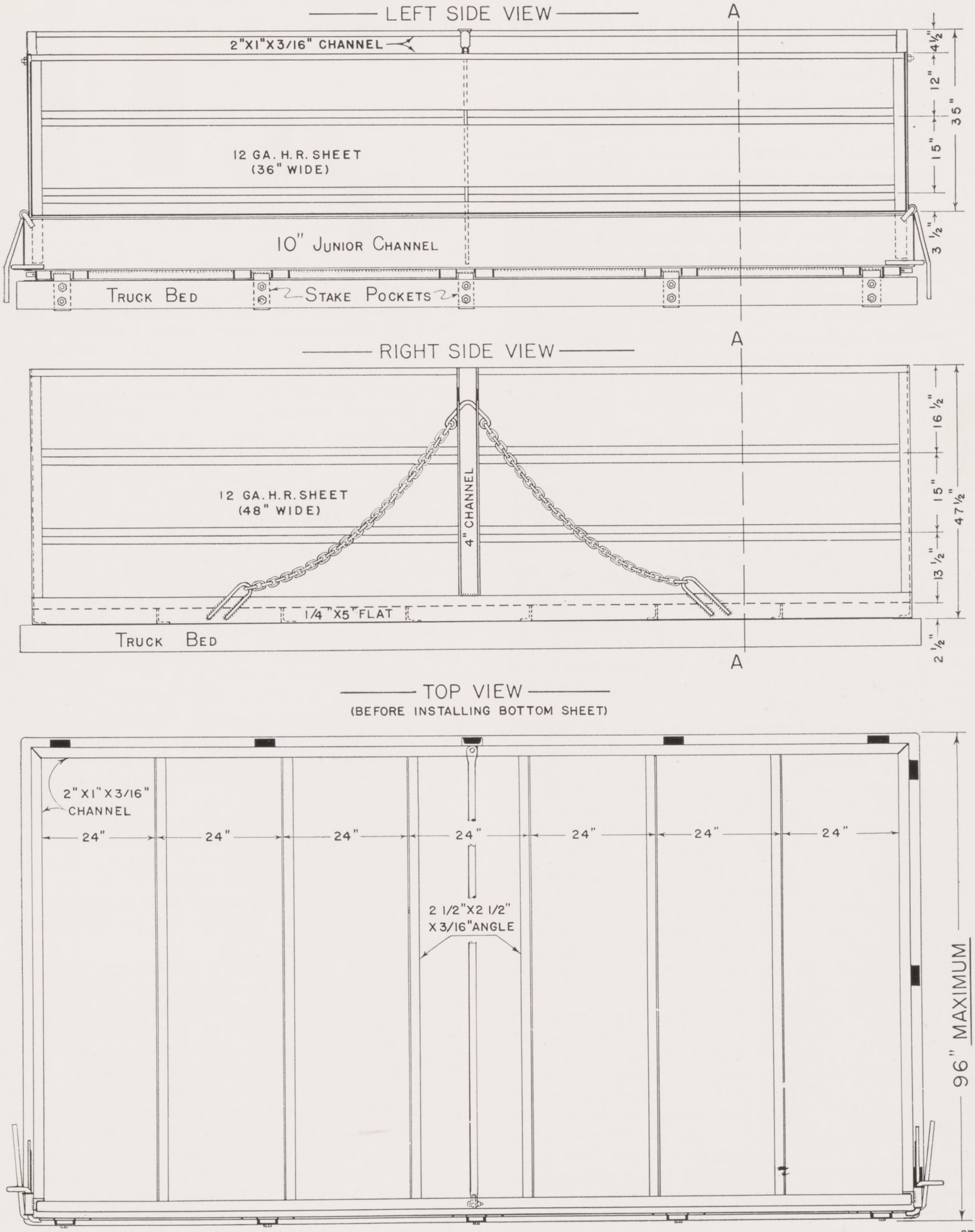
A word or two of explanation is in order. With respect to the maximum width (96″), it is important that the chain or cable sling be within this 96″ dimension even though swinging during travel. (One objection to a cable sling is that the stiff cable may form loops which extend beyond the 96″ width.)

With respect to the spilling of the load, there is nothing in the vehicle code which says that the beet box shall be free of all openings of any size whatsoever. It merely requires that no load be spilled. Therefore, the letter of the law could be served if the beet bed is constructed of boards spaced at a distance less than the smallest beet which might be expected to occur in the load. In any event, when any portion of the load, be it beets or dirt, is spilled during travel on a public highway, the operator of the vehicle is responsible in the event of civil suit arising from such spillage.



36

BEET BED—end view, section A-A and details of construction.



37

BEET BED—left side, right side and top views. Lengthwise dimensions are not shown, since these will vary to suit the individual truck.

SPRECKELS SUGAR COMPANY RESEARCH—A PROGRESS REPORT

By DR. RUSSELL T. JOHNSON
Director of Agricultural Research
Spreckels Sugar Company

DAY-TO-DAY progress on research projects seems sometimes to be so slow that the work, 'progress' is hardly justified. But in reflecting upon the progress for a year, some significant accomplishments come to light. From time to time certain materials or ideas are promoted as being spectacular in nature and their proponents indicate that they will revolutionize certain aspects of beet growing. When viewed from year to year, however, time has allowed them to settle more appropriately into their deserved place and a better evaluation of them can be made. Examples of the spectacular types of materials are new fertilizers, insecticides, seed treatments, weed killers and various soil additives.

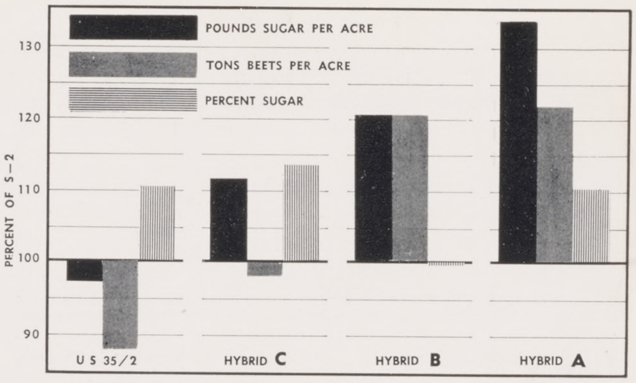
In sharp contrast to the spectacular developments is the routine of carrying out long range research projects designed to provide continuing improvement in the sugar beet crop. Typical of this type of research would be variety development.

NEW VARIETIES

Many hundreds of crosses and selections are made each year followed by the careful testing and evaluation of the resulting strains in hopes of obtaining some few strains of beets that will perform better than the ones now in use. Also in this category would come most of the basic research studies in the fields of plant and soil science.

In the Agricultural Research Department of Spreckels Sugar Company we try to include both of the above types of studies for a well balanced program. New materials that become available are constantly being evaluated to determine their effects on certain aspects of sugar beet growing. Many such materials do not show promise and studies are discontinued. However, some are found to be satisfactory and use of them is adopted. These are things that may find immediate use under the right conditions. In addition, a long term program is maintained to develop varieties and information on beet growing. This may take years in acquiring, but it can contribute greatly to the over-all sugar beet crop.

In the development of varieties, it has been our aim to produce varieties best adapted to the locations or needs of the areas in which beets are contracted with Spreckels Sugar Company. We have, at present, seed from five open pollinated varieties plus small amounts of hybrid seed that appear to do a fairly good job of filling the needs of the conditions under which beets are grown for Spreckels Sugar Company. At this time the most encouraging thing with regard to variety production is the transition that is now underway from the open pollinated type varieties now in use to new hybrids. In widespread tests throughout our beet growing areas in 1957, some of the new experimental hybrids consistently headed



38

HYBRID VARIETIES possess the ability to develop higher sugar (Hybrid C), larger roots (Hybrid B), or even a combination of both (Hybrid A). This is one of the Spreckels Research program's achievements.

the list of varieties tested. In our early studies with hybrids it seemed that their most important value was to grow larger roots, but more recent developments indicate that some hybrids possess the ability to develop not only larger roots, but also show an increased sugar percentage as compared to the varieties now in use. The development of hybrids has generally required the incorporation of the various desirable characteristics into strains that were to be used as components of the hybrid. In addition, there were some problems in isolating and maintaining male sterile strains necessary for hybrid production that needed to be solved. Most of these problems have now been solved, and commercial hybrids now depend mainly upon the combining of strains that produce the most desirable crosses, and then increasing them for commercial useage. It is possible for hybrids to be more specific in nature than are the open pollinated varieties now in use. A certain hybrid variety, for example, may be very good for one location but not have any advantage in another. Probably the best way to indicate the interest of Spreckels Sugar Company in hybrid sugar beet production is by a review of our contemplated seed supplies. From a rather small amount of hybrid seed available for the 1957 crop and a somewhat larger amount available in 1958, it is expected that approximately one-half of our seed supplies for the 1959 crop will be of hybrid varieties.

One study that we have made recently concerns gibberellic acid and its effect on sugar beets. Gibberellic acid has shown some remarkable effects when applied to several types of plants, particularly in stem elongation. This could be of value in sugar beet seed production or breeding work, where speeding of the reproductive process may save time. Greenhouse testing showed remarkable results in speeding the development of a seed stalk and the material is now used regularly on breeding material in greenhouse work. After a year of working with it in the seed fields, however, we have not been able to demonstrate any value in its use. It appears to have little effect on either the percentage of plants bolting or the rate at which they set seed under our seed growing conditions.

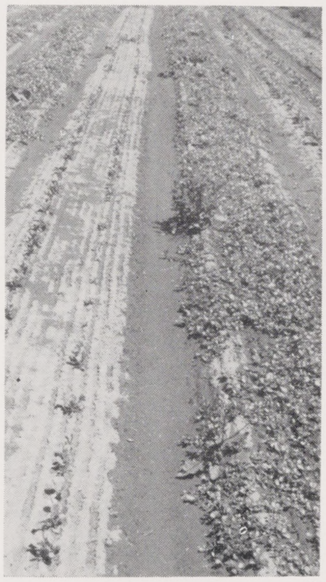
WEED CONTROL

Weed control is another project that has received attention in the past few years and will continue to do so. The control of weeds is one of the main costs in the production of sugar beets. The loss from weeds is twofold; the actual cost of their removal and the less apparent loss from reduced crop yields due to weed competition. Of the weeds that constitute a serious problem in beets grown for Spreckels, probably none is more important than water grass.

It becomes the greatest problem late in the season after the beet foliage has grown large enough to stop cultivation. Chemicals that have been studied that will do a satisfactory job of killing the grass, unfortunately have a deleterious affect on the sugar beets also. Pre-emergence applications of chemicals for the control of watergrass in beet fields have not generally been effective because the time between application and emergence of watergrass is too great. Chemicals are still, however, being studied, and some excellent control of watergrass has been obtained with later plantings.

In studies on weed control several things become apparent. One of the first is that the best weed control practice is a good heavy crop plant population. Once the foliage of the sugar beets has covered the ground weed growth is greatly retarded. Another practice is to arrange the rotation in areas where watergrass is a problem so that beets do not follow crops that encourage the growth of watergrass, such as rice, milo or field corn. Another is to cultivate somewhat later if watergrass is a problem than would otherwise be done. A late cultivation with side knives does a satisfactory job of controlling late watergrass, and aids in water penetration.

SELECTIVE HERBICIDES can give good control of many broadleaf weeds (bed on left), but watergrass is a stubborn weed which does not always yield to chemicals unless applied in amounts dangerous to the beet crop.



39

DISEASES AND PESTS

Nematode continues to be one of the most serious threats to the beet industry in California. Two kinds of nematode that are widely distributed and capable of attacking sugar beets are the root knot nematode and the sugar beet nematode. The root knot nematode is generally found in lighter soils and in many of the areas where it occurs, soil fumigation is a sound practice, because the cost is well repaid in increased yields of sugar beets. Such is not the case, however, with the sugar beet nematode. This parasite is usually found in heavy soils where fumigations have not given satisfactory control under California conditions. Fortunately, in California, early planting does afford some insurance against devastation by the sugar beet nematode, so early planting together with long rotations without susceptible crops other than sugar beets in nematode infested ground appears to be the best method of living with the sugar beet nematode at present. In special nematode plots at both Spreckels and Woodland testing of new materials or new methods of applying already available materials is continuing in the hope of finding a method of reducing the danger to the sugar beet crop from the sugar beet nematode.

Another method of attempting to combat the sugar beet nematode is by the development of strains of sugar beets that will resist their attack. This approach is being made by selections within strains of the sugar beet and by making crosses between the sugar beet and some wild related plants that are known to be resistant to attack by the sugar beet nematode. Our own efforts have been made by crossing beets to the wild related plants. Beginning with the original cross, three successive backcrosses to the sugar beet have resulted in plants that strongly resemble the sugar beet and in greenhouse tests give evidence that some of the nematode resistance of the wild ancestor may have been retained. Due to small seed supplies of this material no field tests have yet been made but they will be made during the summer of 1958. At this time we have a great deal of interest in this phase of the nematode project.

DR. JOHNSON holds a plant which is the third back-cross to sugar beet of a cross between sugar beet and a relative resistant to nematodes. It is close to a commercial sugar beet variety, yet retains its "Great Grandmother's" resistance to nematodes.

40

Under particularly intensive study is a situation that developed in 1957 in the southern end of the San Joaquin Valley. Several diseases, and possibly

(Continued on Next Page)

SPRING HARVEST

(Continued from Page 18)

The 1958 spring campaign is the first one in which all three Spreckels' factories have operated. The fact that two of the three factories operated with relatively short campaigns indicates that even greater tonnages can be processed in the spring should an extension of this operation become desirable or necessary. The combined use of rail cars and transport trucks went smoothly and in general, no transportation shortages were encountered.

Late in the spring period dirt and clods became a major problem both to growers and to the factories. It is probable the beet deliveries could have been accommodated even faster had it not been for excessive dirt. Cloddy conditions are normally avoided by a scattering of spring rains. But this year no appreciable rain fell once harvest started, and as a result most fields became hard and dry. Some modifications will be made this year at many receiving stations to permit better handling of beets under these adverse conditions.

The Company believes that the adoption of a scheduled spring campaign has permitted all growers a flexibility not formerly available. It provides longer grower seasons, option of later planting dates, larger acreages through extended use of processing capacity, and, to some degree, relief from the pressure of completing harvest in the fall.

DAMPING OFF

(Continued from Page 18)

start, and thus outgrow fungi that are present. Depth of planting is a big factor in determining the time required for emergence. Sugar beets should be planted not more than 2 inches deep, preferably less, so that emergence is not unduly delayed, thereby weakening the seedling.

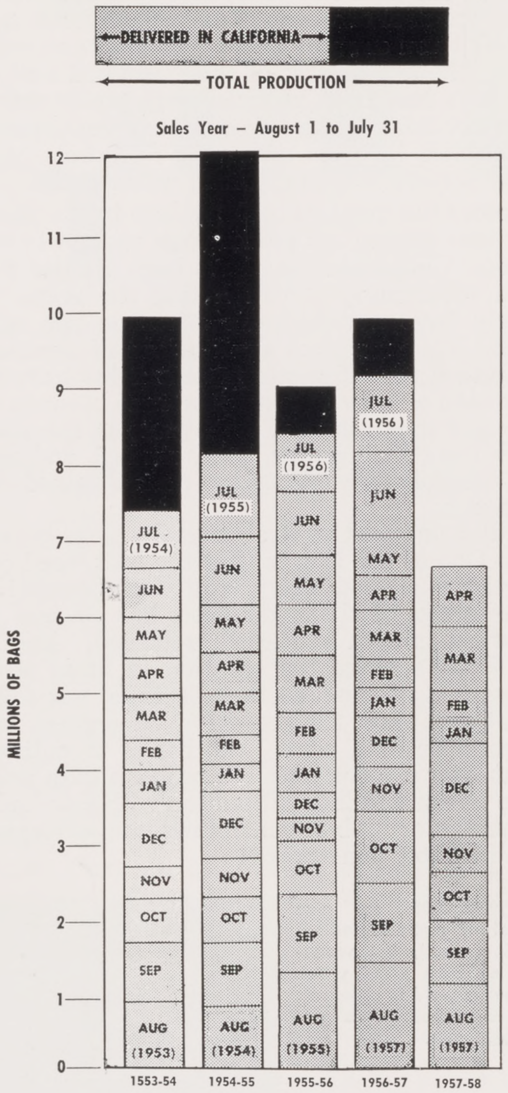
RESEARCH

(Continued from Page 23)

some as yet unknown factors, created in that area what amounted to a crop failure. Tonnages averaged only about one-half the normal for that area, sucrose percentages were extremely low, and the beet purity was very low. This study is a cooperative effort involving all of the sugar companies operating in that area, the Extension Service, The United States Department of Agriculture, The University of California, some equipment dealers, some agricultural chemical suppliers and the local beet growers. Seldom has such a concentrated effort been made on a problem. Out of this study it is hoped that information will be forthcoming that will provide not only the exact causes of the beet deterioration, but also practical methods of confining and controlling it.

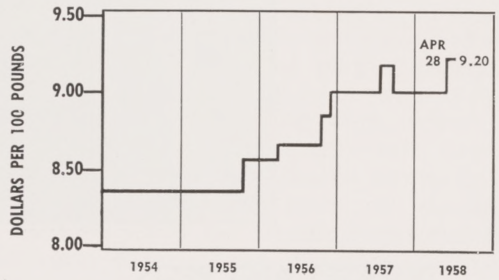
These are brief summaries of a few of the many projects being studied by the Agricultural Research Department of Spreckels Sugar Company in an attempt to provide beet growers with the best material and information that can be made available.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR

In 100 Lb. Paper Bags, F.O.B. San Francisco



41

The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers. Mention of specific methods, devices and implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.

AUSTIN ARMER, Editor   SPRECKELS SUGAR COMPANY   WOODLAND, CALIFORNIA

PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

SPRECKELS SUGAR BEET BULLETIN

VOL. 22 JULY - AUGUST, 1958 NO. 4

42

READY FOR YOUR SUGAR BEETS

Harvest time is here again. Receiving stations have been readied — some with major changes to provide for

BETTER CLEANING

and

FASTER LOADING

NEW FACILITIES FOR SPRECKELS AGRICULTURAL DEPARTMENT

THE BUSINESS of the Spreckels Agricultural Department includes the maintaining of a continuous flow of beets to the factories. To accomplish this end, the agricultural department must provide facilities for receiving beets delivered by growers' trucks; must assume the responsibility of maintaining these facilities in constant operative condition, and must renew them whenever changes in technology or custom arise.

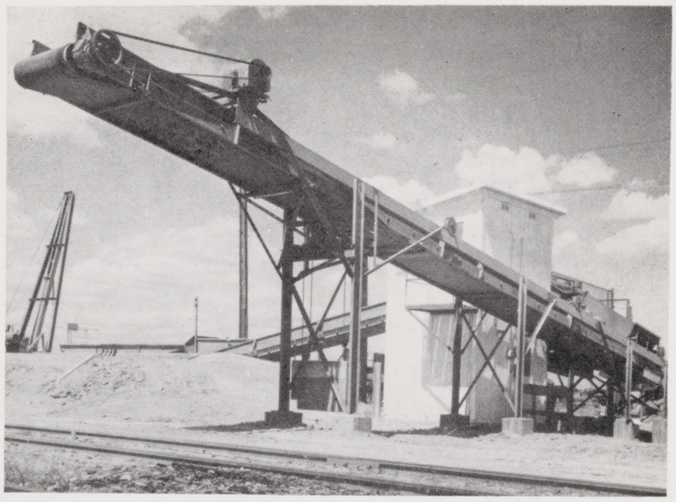
One of the major aspects of receiving sugar beets, especially during late fall and spring, has been the

43
DIRTY BEETS like these, in the past, have caused the loss of hundreds of hours spent in cleaning out screens, with consequent delays to the unloading of growers' trucks.

tremendous amount of dirt and trash delivered with the beets. The elimination of much of this dirt and trash at the receiving points would, of course, be beneficial to the Spreckels Sugar Company in its operations. But more important to growers is the uninterrupted operation of receiving stations. Nothing is more disturbing to an orderly harvest than interruptions in beet receiving.

The most frequent cause of interruption is the delivery of excessively dirty beets. That is why the agricultural department has so often emphasized the need for reducing the amount of foreign material delivered with the beets.

Over the past ten years, the Spreckels Agricultural Engineering Department has been doing some very



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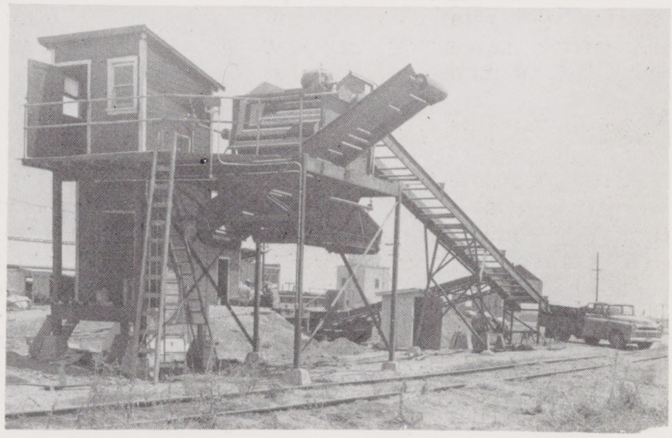
AT DEL PASO, the new loading station has an inclined shuttle conveyor which delivers either to rail cars or to transport trucks. Power operation makes the change in less than 20 seconds.



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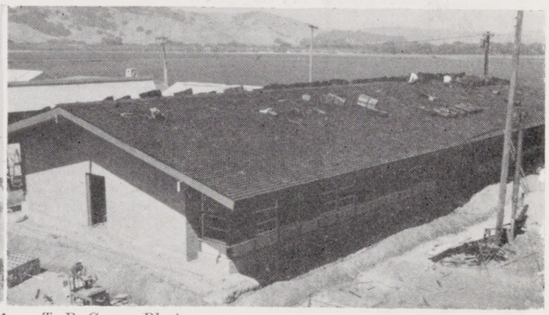
AT CROMIR, the new loading station has increased capacity and superior beet-cleaning facilities. Relocating the loading point provides space for an additional railroad car.

intensive development work on screening devices which would operate under extremely severe conditions. As a result, a new type of screen has been developed which is not only more effective in cleaning beets, but far more resistant to stoppage due to excess mud or trash.

The fall campaign will start with these new screening facilities installed at each of the three factory

1887 — WATSONVILLE. This was the weighing and accounting office of Claus Spreckels' first beet sugar factory.

44
1898—SPRECKELS. Still standing is the old Factory 1 office building which originally housed both factory and agricultural offices.



T. B. Green Photo
47
1958—SPRECKELS. This new office building will accommodate the Agricultural and Financial Departments at Factory 1. Completion is scheduled for September 1.

truck receiving stations. In addition, the improved screens have been installed at Comstock, Conner, Libfarm, Los Banos, and South Dos Palos.

TWO NEW RECEIVING STATIONS

When a receiving station becomes outmoded, either because it no longer can accept the larger trucks used by growers or because it cannot handle the increased beet tonnage, it is the policy of the Spreckels Sugar Company to make whatever changes or improvements may be indicated.

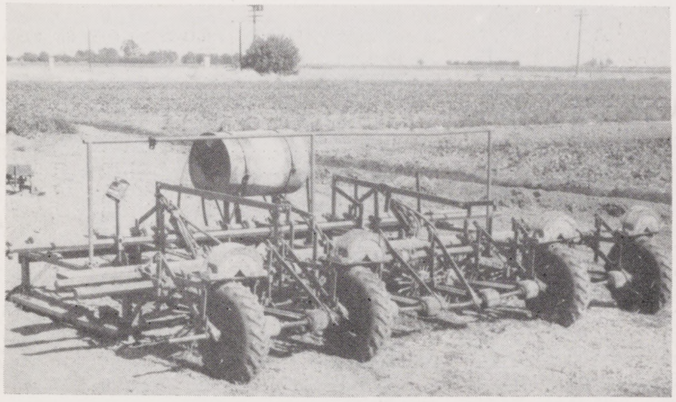
The Del Paso receiving station represents a new development in receiving facilities. It was designed entirely by the Spreckels Agricultural Engineering Department, and was constructed by the Sacramento Maintenance Yard staff, aided by local machine shops. This station is designed so that beets may be delivered either to railroad cars or transport trucks, the changeover being made in something less than twenty seconds with the flip of a toggle switch.

At Cromir, the serviceable portions of the existing station were retained while new elements (including an entirely new screen, car loading conveyor and incline belt of increased capacity) were installed.

NEW SPRECKELS OFFICE BUILDING

Growers whose business takes them to the agricultural offices at Spreckels will be greeted in a new building which has been erected to replace both the old main office building and the agricultural office building at Factory 1, Spreckels. Work on this new and attractive building started on April 28, and completion is expected at the time this issue of the Sugar Beet Bulletin comes off the press. Five thousand square feet of floor space will provide offices for the members of the agricultural and financial departments, as well as a communications center and personnel headquarters.

Progress in architectural styling and construction methods over the past 71 years is illustrated on page 26. Each of these three buildings was designed to serve the same purpose, but it is interesting to note the progress from stark necessity to substantial dignity, and finally to functional informality.



48

THIS SLED was constructed by Dixon Dryer Co., and performed all operations of bed-forming, planting, cultivating and thinning on 105 acres of sugar beets.

MORE MACHINE THINNING IN 1958

CALIFORNIA HAS LAGGED in the adoption of machine thinning in comparison with other beet growing States. However, 1958 has witnessed a marked upturn in the use of thinning machines by Spreckels growers. At least 38 growers used mechanical thinning, and for the most part the results are thoroughly satisfactory. Furthermore, machine thinning holds promise of much more rapid increase when weather conditions become more nearly normal. The extraordinary wet spring of 1958 led to a very large late-planted acreage, with consequent poor stands due to damping off and insect damage.

Of particular interest is the ingenuity displayed by some growers, who either mounted trailer-type thinning machines on their tractors or on their cultivating sleds. The latter combination is particularly appealing because the accuracy of placement of the cutter heads both laterally and vertically is conducive to the best quality of work.

So popular has the sled mounted thinner become in 1958, that nearly half the Eversman machines in use by Spreckels growers were mounted on KC cultivating sleds. These custom built combinations were supplied by Yonkers & Johnson of South Dos Palos.

Another marked trend in the use of mechanical thinning is the elimination of all hand work. As confidence in the machines increases, growers are inclined to let the machine do the entire job with consequent important cost savings.

The table below indicates the distribution of machine makes and methods of operation:

Number In Use	Make of Machine	Method of Operation
3	Dixie	1—Once over + long handled hoe 1—Once over + short handled hoe 1—Twice over only
22	Eversman	5—Once over only 3—Twice over only 14—Once over + long handled hoe
13	Silver	4—Once over only 6—Twice over only 3—Twice over + long handled hoe
38		

49

A SAMPLE of the work done by two passes of the sled-mounted Dixie thinners. Photographed about two weeks after thinning.

The Honor Roll For 1957

These are the Spreckels Growers who produced crops which yielded 25 or more tons per acre during the 1957 crop year. This is by far the largest list on record—proof of a marked trend toward better farming.

DISTRICT I — SPRECKELS

50

TOM MINE' AND BILL MINE' were top growers in District 1, with 46.15 tons per acre.

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Mine Brothers	12.4	46.15	10,430
Tony L. Silveira	18	44.45	13,078
Tony Homen, Jr.	21	43.82	11,438
L. C. H. Company	34.6	43.11	12,554
Raymond Martin	22	41.92	11,494
R. Sargenti & Son	17	41.23	12,336
R. J. Thorne	19.2	40.70	10,484
Fujii Brothers	5.0	40.18	11,878
O. O. Eaton	25.2	39.88	11,502
Lazo & Deo Campo	14.2	39.56	12,288
Edwin Tognetti	65	39.47	11,518
Strula Brothers	8	39.07	11,650
West Coast Farms	26	38.92	12,010
William Crinklaw	39	38.85	10,948
M. S. Furtado & Son	10	38.77	9,932
J. J. Crosetti	43	38.31	10,390
Carl Schulz	16	38.17	11,412
William Crinklaw	104	38.01	12,094
Alvin Noll	52	37.37	11,330
A. D. Villarba	17	37.05	11,122
Mine Brothers	15.8	36.98	9,364
Sears Brothers	24.0	36.96	9,802
E. H. Abeloe & Son	37.6	36.82	11,716
Joe C. Gonzales	8.0	36.05	11,846
Edward A. Johnsen	52	36.05	10,800
George Boutonnet	9.3	35.98	9,578
Vanoli & Bravo	16	35.43	9,262
Chester B. Imwalle	19.7	35.37	8,594
W. B. Grainger Packing Co.	16.2	35.24	9,854
Massa Brothers	22.3	35.15	8,050
Arthur W. Buzzini	35	35.12	10,634
Martella Brothers	38	34.72	11,422
A. S. Duarte	37	34.47	10,444
Roy Alexander	18.2	34.37	11,398
Gerald Griffin	34.4	34.31	10,636
Charles & Robert Lanini	50.0	34.26	9,340
H. F. Krafton & Son	21.7	34.24	10,978
Corda & McDougall	42.0	34.13	11,440
Obata Brothers	57	33.91	10,574
M. P. Domingos	53	33.88	8,734
Harlan & Weatherly	21	33.81	11,462
West Coast Farms	31.5	33.81	10,880
Lanini Brothers	7.5	33.74	10,062

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Alvin Noll	30	33.67	10,108
Charles Gianolini	29	33.60	10,128
Obata Brothers	23	33.57	9,414
Jackson E. Vessey	8.0	33.56	11,700
Mary F. & E. E. Nutting	17	33.46	10,914
Conley & Hardwick	4.0	33.34	10,122
Valdemar Schmidt	15.0	33.06	10,770
W. M. Jensen & Son	19.3	32.89	8,868
William D. Crinklaw	34	32.80	8,960
Joe Cunha	57.7	32.79	9,082
R. B. Little	50	32.71	10,460
Arthur W. Buzzini	45	32.68	9,444
Lazo & Deo Campo	15.2	32.67	10,264
Antonio F. Silveira & Sons	9	32.62	10,648
T. G. Bacciarini	59	32.59	9,478
Mary F. & E. E. Nutting	17	32.46	10,614
Joe Gerber	14.0	32.41	11,220
Lindeleaf Brothers	24	32.41	9,782
Leo & Robert Meyer	27	32.39	9,374
Schween Brothers	20.0	32.37	11,168
Jackson Vessey	26.2	32.10	9,990
Borzini Brothers	43	32.01	9,988
W. & S. Packing Co.	22.0	31.98	9,210
Maynard H. Frudden	9	31.89	8,222
L. C. H. Company	14.0	31.83	10,172
Joseph Gubser, Sr.	19	31.82	10,514
F. S. Travers & Son	22.5	31.80	9,426
Joe Pacheco	10	31.74	10,340
Phillips Wyman	27.0	31.70	9,802
Sam L. Mann	8.0	31.68	10,720
O. O. Eaton	23.1	31.66	8,554
James Vanoli	16.0	31.58	9,544
Lee F. Smith	44	31.54	8,692
Tom H. Okita	17	31.46	9,570
Raymond Martin	72	31.40	9,288
McNamee Ranch	15	31.39	10,152
W. D. Loveless & Son	18.5	31.35	9,530
Frank Taylor	60	31.33	8,754
Tognetti Brothers	38	31.30	10,498
Salinas Valley Vegetable Exchange	171.0	31.30	9,214
John D. Domingos	34.9	31.29	10,050
Schween Brothers	13.0	31.08	9,020
Bob & John Corda, Jr.	15	31.06	9,784
Michael K. Reed	37	30.99	9,222
Leo & Robert Meyer	86	30.74	9,800
G. P. Sgheiza	21	30.66	9,714
Franscioni-Griva Co.	42	30.61	9,588
I. Sciaroni & Jack Ferrasci	31	30.59	9,636
Jim Fanoe	59.0	30.55	9,948
Jim Fanoe	110.0	30.53	9,416
Fabretti & Dedini	56	30.49	8,598
Ben Masciarini	40	30.37	8,984
William Hart	12	30.34	10,340
Albert Rohde	23.0	30.33	8,954
Salaberry & Guidici	94	30.31	10,172
Manuel Perry	26.0	30.30	7,690
Mary F. & E. E. Nutting	34	30.25	9,444
Soares & King	39	30.24	10,106
Al Massera, Inc.	22	30.21	8,598
Michael K. Reed	27	30.21	7,534
Ambrosini & Pisoni	29.0	30.17	9,504
Bennie S. Black	31.0	30.09	8,960
Charles S. Gubser	17	29.95	9,488
A. Radavero & E. Vosti	10.0	29.95	8,704

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Joe Alves	12.0	29.86	9,168
Albert C. Hansen & Son	159.0	29.81	9,426
B. J. Marks Family	194	29.77	9,508
Bellone & Del Chiaro	38.9	29.73	9,620
J. E. Culver & Son	78	29.47	9,124
Hatton J. Martin	42	29.34	9,154
K. Kamimoto	15	29.32	9,260
A. Vosti	42	29.32	8,930
W. L. Stacey	79	29.28	9,048
Danini Brothers	20	29.19	8,558
Albert Rohde	27	29.17	7,852
Clark & Romans	64	29.14	8,474
Pasque & Franscioni	22	29.14	8,474
Gularte Brothers	35.7	29.13	9,048
Foster Hutchings	26	29.07	8,808
Joe Huber	13	29.02	9,466
Paul Giacomazzi	19	29.02	8,926
Nunes Brothers	54.1	28.98	8,700
Lawrence Albertsen	49	28.96	9,094
Gabilan Packing Co.	25	28.94	8,248
Pete Fanucchi	68.7	28.89	9,406
L. & A. Salmina	9.9	28.89	8,974
Quattrin Brothers	24	28.86	9,442
Charles Morgantini & Sons	22	28.86	83.52
C. L. & A. W. Johnson	55.9	28.61	9,258
Peter Lesnini	26	28.60	8,362
Herold Ranches	122	28.50	8,516
Tom Hudson	15.4	28.33	7,582
Schween Brothers	29	28.32	9,386
Ralph B. Stacey	14	28.30	9,328
George W. Ross	53	28.22	8,574
Bassi Brothers	23	28.14	9,438
Henry Moranda	15	28.13	9,462
R. V. Boone	36	28.05	8,964
Charles A. Kelly & Son	52	28.04	8,490
Pryor Farms	55	27.98	8,416
R. A. Renz	30	27.96	9,764
Schween Brothers	32.1	27.80	8,046
Martella & Buzzini	25	27.68	8,508
Phillips Wyman	18.2	27.65	8,782
Pete Vojvoda	15.5	27.62	8,810
W. R. Stephenson & Son	24.6	27.61	9,172
Tom DaRosa	67	27.61	8,306
Jay Muther	34.8	27.54	9,418
Joseph Gubser, Sr.	34	27.48	8,750
Joe F. Filice	4.0	27.40	7,936
Leo & Robert Meyer	34	27.38	7,010
Fred Borelli	14	27.30	8,812
G. A. Stephens	26	27.28	8,980
Wilmer Pura	10	27.24	7,748
G. W. Herbert	46	27.19	8,516
W. W. Johnson & Sons	76	27.11	8,924
Joe P. Gambetta	27	27.10	9,128
Francis H. Rianda	8	27.10	8,570
T. R. Smith	55	27.08	8,628
Anthony Silva	129	27.06	7,944
Angelo Corda	22	27.04	9,134
L. & A. Salmina	28.4	27.04	6,560
H. Allemand	65	26.98	8,402
Delfin Martin	37	26.89	9,046
A. S. Nyland	86	26.79	8,170
Peter A. Stolich Co., Inc.	30	26.74	7,932
Anthony Silva	71	26.74	7,744
Obata Brothers	43	26.70	9,014
Al Massera, Inc.	44	26.68	7,956
J. G. Marinovich	61.4	26.67	8,374

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Paul Giacomazzi	18	26.58	8,682
Dean Pryor	62	26.56	8,908
H. Rianda	36	26.54	6,746
Norman F. Bundgard	66	26.47	8,226
Al Massera, Inc.	39.4	26.46	7,890
Ning Young & Sons	16	26.41	9,128
James & Manuel Luis	188	26.41	8,292
Bruce Church, Inc.	35	26.41	8,018
United Farms Co.	93	26.38	8,268
Henry Guidotti & Sons	40	26.36	8,514
Manuel Baliel	116	26.36	8,076
Moresco & Rosa	8.4	26.32	9,022
James M. Johnsen	23	26.32	8,638
William Hart	3	26.15	8,912
Turri Brothers	66	26.15	8,620
E. Vosti & Sons	14	26.13	8,106
Farley Fruit Co.	86	26.13	7,718
Joseph B. Silva	26	26.11	8,340
James H. Watson	20	26.08	8,080
T. R. Nishimoto	18	26.01	9,146
Michael K. Reed	45	26.00	6,636
J. J. & H. Violini	21	25.99	8,562
Willis G. Pack	14	25.97	8,866
Lawrence Brickey	28	25.92	8,118
William Yamano	80	25.91	8,312
A. Leonardini	25.7	25.86	8,234
Nunes Brothers	13	25.83	8,220
Tognetti Brothers	24	25.78	8,178
Luis Scattini	25	25.71	8,612
A. & D. Christopher Ranch	31	25.70	8,178
Ira E. Hudson & Son	74	25.60	9,114
Joe F. Filice	54	25.52	7,860
Antonio F. Silveira & Sons	32	25.50	8,532
Bob Corda, Sr.	8	25.47	7,936
Manuel Baliel	96	25.43	9,856
Manuel Silva	79	25.41	8,208
Fausto Morisoli	7	25.39	8,090
Michael K. Reed	25	25.33	8,466
Bruce Church, Inc.	59	25.29	6,930
Thomas Nunes, Jr.	23	25.20	7,288
Anthony Rose	20	25.20	7,086
D. R. Lemos	56	25.18	6,950
Tondre Alarid	53	25.17	8,548
T. E. Usrey & Son	76	25.09	8,630
Mariano Sanchez	114	25.08	7,900
Pete Fanucchi	67.9	25.08	7,428
Roy Borelli	14.2	25.07	7,872
Franscioni & Company	24	25.06	8,204
Casillas Brothers	37	25.00	8,460
Louis L. Gularte	80.3	25.00	6,986

DISTRICT II — MANTECA

51

BOGETTI BROTHERS, GEORGE and ALBERT were top growers in District 2, with 43.20 tons per acre.

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Bogetti Brothers	25	43.20	9,642
Joe Sabbatini	37	41.92	10,984
Bogetti Brothers	32	40.24	9,626
A. Pellegri & Son	13	40.20	11,006
S. Nogare	54	39.44	9,986
Nishida Brothers	29	38.74	10,188
Marvin Bargagliotti	16	38.63	9,766
Manuel J. Gonsalves	60	38.58	9,768
F. L. Williams	12	38.51	11,036
Albert L. Bevis	28	38.51	9,258
Albert J. Perry	61	38.46	11,276
Bogetti Brothers	80	38.41	9,204
R. E. Thorsen	57	38.32	10,638
Tom Sanchez	29	38.16	11,310
Hengst Farms, Inc.	26	37.93	11,084
Norman Vogt	162	37.92	10,458
George Maria	15	37.59	9,624
Matsuoka Brothers	13	37.31	10,446
Al Fonseca	20	37.14	9,886
Edward R. Lewis	70	37.11	11,156
Joseph A. Pastorino	57	36.95	9,430
Tony A. Sanchez	64	36.90	10,332
Joe Escobar, Jr.	29	36.84	10,366
Pelucca Brothers	71	36.72	10,178
J. Sanchez & Sons	134	36.72	10,128
Craven Brothers	50	36.72	10,068
L. Gerhart & Son	40	36.68	10,418
Robertson & Sons	93	36.52	9,634
Ray Worley	20	36.46	10,602
Frank Giannicchini	13	36.44	8,534
Norman Vogt	57	36.43	10,200
Vito De Leo	14	36.34	9,746
Oliver Giannecchini	28	36.27	8,742
David Vana	22	36.20	9,506
Manuel Fialho	47	36.19	10,228
Johnny Dasso	35	36.03	10,290
Schizue Mizuno & Sons	13	35.97	10,230
Lloyd Shimer	12	35.83	10,390
B. Del Carlo & Sons	40	35.82	10,774
Grant & Wilson	24	35.80	10,204
Mitsuo Kagehiro	11	35.78	10,132
Louis Quilici	29	35.78	9,010
G. Caffese & Sons	12	35.57	10,144
John L. Miller	37	35.54	10,434
J. Venturini	22	35.51	10,334
Kiyoi Brothers	34	35.16	9,170
Hanson & Barkley	133	35.04	7,030
Charles T. Orange Est.	10	34.94	10,342
Albert Lerno	11	34.57	9,072
Al Guadagnolo	40	34.39	9,774
G. Caffese & Sons	12	34.29	8,764
Bogetti Brothers	30	34.21	8,526
Robert L. Peterson	18	34.21	9,182
Richard E. Mahon	90	33.99	9,394
John Podesta	23	33.80	8,930
West Coast Grape Farms	26	33.60	9,032
Sakakura Farms	18	33.39	10,038
Porter Land Co. of Calif.	53	33.39	6,110
John Baragno	33	33.07	9,062
Lester Rodgers	100	32.94	9,480
Richard Alcock	15	32.93	9,096
The Newhall Land & Farming Co.	50	32.89	8,860
Robert & John Bogetti	72	32.88	9,114
Bogetti Brothers	46	32.74	7,662
James & Robert Bundgard	110	32.66	8,668
Arthur A. Sakamoto	32	32.63	8,556
Melvin A. Baumbach	64	32.08	8,014
Salisbury & Johnson	35	31.99	9,150
Jack D. Jones	46	31.79	8,666
Calvin Thomas	38	31.76	9,064
The Desert Ranch	31	31.64	9,132
Manuel Neves, Jr.	17	31.16	9,260
Donald Fink	27	31.12	8,682
H. L. Rodgers	20	31.09	9,408
George B. Lagorio	112	31.05	9,346

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
L. E. & Roy E. Altamirano	13	30.95	7,428
Uyeda Brothers	22	30.79	7,814
Louis Kaelin	20	30.76	8,618
M. E. Ables	12	30.76	7,548
Wolfsen Brothers	18	30.70	8,602
W. C. Williamson	35	30.63	7,946
Howard E. Moore	12	30.60	8,310
Grant & Wilson	74	30.49	7,800
Jones & Micheli	78	30.41	7,888
The Newhall Land & Farming Co.	50	30.40	7,618
Reese Brothers	24	30.18	9,108
Herman Ohm	20	30.15	8,792
Octovino D. Nogare	19	30.06	8,556
H. E. Nagata	29	30.00	9,054
Crecelius & Baumbach	110	29.95	9,236
Stone & Ashworth	20	29.93	8,932
Robert Giannecchini	20	29.87	7,760
The Newhall Land & Farming Co.	44	29.69	8,224
Charles W. Hunt & Wilbur B. Salmon	16	29.59	8,776
Edward Giovannoni	35.2	29.54	9,010
Charles & Richmond Ferdun	28	29.42	7,732
The Newhall Land & Farming Co.	49	29.41	8,188
Sam & D. M. Biancucci, Inc.	146	29.38	7,826
Lyons Brothers	58	29.32	8,344
C. T. & T. Company	64	29.30	8,860
L. Merlin Miller	20	29.13	7,696
Neville Knowles	10	29.12	8,782
Norman Vogt	24	29.11	8,506
George B. Lagorio	85	29.11	9,246
A. J. Cardoza & Son	50	29.01	7,682
Clayton Brown	32	28.92	8,364
George H. Clever	15	28.89	7,864
William E. Glotz	35	28.86	8,288
Malcolm McCormack	29	28.83	8,130
Sam & Dominic Lomanto	66	28.81	7,272
The Newhall Land & Farming Co.	173	28.78	7,292
Locke Ranch—Russell	33	28.77	7,882
J. F. Soares	20	28.52	8,066
A. Villalobos & Sons	120	28.52	8,648
Lyon & Hoag	28	28.50	8,242
William H. Fisk, Jr.	53	28.50	7,096
A. & R. Lagorio	12	28.49	8,336
William Yamano	231	28.47	7,220
R. M. Baty & Son	222	28.47	7,396
The Desert Ranch	113	28.43	8,416
The Newhall Land & Farming Co.	173	28.43	7,182
The Desert Ranch	30	28.42	8,316
George Silva, Jr.	34	28.37	8,472
Erreca Farms	24	28.37	8,408
John V. Celle	16	28.32	7,732
Nishida Brothers	57	28.25	8,990
Henry C. Fisk & Harry M. Fisk	79	28.24	7,462
H. C. Harmon	50	28.11	8,372
Joseph Widmer	62	28.05	7,494
Calvin Thomas & C. F. Thomas	78	28.03	7,966
Battinich Brothers	120	27.97	7,620
Francis E. Hammer	20	27.94	7,326
Bertrand Thomas	159	27.89	7,486
Dolf & Kent Brothers	27	27.87	9,192
Nobuo Sakamoto	86	27.82	7,874
E. Marsh	50	27.69	8,140
Harold D. Gerhart	13	27.67	8,152
Volk & Jarrott	42	27.63	8,156

(Continued on Next Page)

DISTRICT II — MANTECA

(Continued)

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Tony Castanho	42	27.59	8,232
E. L. McGill	39	27.56	8,124
The Newhall Land & Farming Co.	31	27.56	8,098
Pacific Fruit Exchange	167	27.55	7,928
Anthony Alves	12	27.54	8,516
The Desert Ranch	45	27.52	7,122
Ed Thoming	35	27.50	7,882
The Desert Ranch	26	27.48	7,492
Joseph L. Nomellini	60	27.48	7,100
Dennis W. Leary	135	27.43	3,401
James P. Hamilton	58	27.26	7,534
Tony Castanho	56	27.22	8,008
Marion P. Sanchez	58	27.18	8,072
Brannan Farms	18	27.11	7,526
Fenton O'Connell	55	27.06	7,338
Paul Hanson	138	27.04	7,554
Paul T. Ito	32	26.97	7,168
Takemori Brothers	46	26.83	8,408
Uyeda Brothers	20	26.83	6,718
Mario Podesta	47	26.72	6,150
Valley Farms	175	26.61	7,514
Harold J. O'Banion	14	26.53	7,880
Winston W. Carmean	56	26.43	7,854
San Julian Bros. & Zabalza	54	26.39	8,360
Crecelius & Westgate	39	26.36	7,244
John Bava	14	26.35	7,236
Robertson & Muddiman	46	26.33	7,604
Ernest J. Pastorino	24	26.32	7,886
George W. Mills	34	26.19	7,254
H. M. Karlstad	20	26.10	7,548
Pacific Farms Co.	34	26.09	6,732
Martinelli Brothers	68	26.09	7,770
Ralph Panella	76	26.07	7,102
Elmer Ladd	13	25.99	8,556
Ed Thoming	62	25.99	6,970
Herzog Company	140	25.90	6,496
Takemori Brothers	86	25.89	7,074
The Desert Ranch	85	25.88	7,526
Dwayne Petz	45	25.85	6,758
Sam & D. M. Biancucci, Inc.	137	25.79	7,046
Alberg & Son	22	25.69	7,332
John Plotz	26	25.67	6,936
Angelo Lagorio	20	25.66	7,242
Gerald R. Ulm	18	25.65	8,454
Merrill F. West	90	25.56	7,270
Marion P. Sanchez	42	25.54	7,478
Conley & Hardwick	226	25.54	6,462
Sousa Brothers	105	25.50	6,426
Fred Trowbridge	136	25.46	7,622
Porter Land Co. of Calif.	18	25.45	5,930
Est. of Tony Ferreira	59	25.40	7,426
Fritz Sterchi	76	25.38	7,472
Sam & D. M. Biancucci, Inc.	151	25.37	6,992
Jack Plotz	9	25.37	6,510
Clarence Provost	20	25.32	7,160
Nick Spanu	31	25.24	7,052
Pryor Farms	146	25.23	6,924
John Narducci	12	25.19	7,568
Paul Bettencourt	45	25.14	7,612
S. Nogare	21	25.14	6,048
J. W. McBee	11	25.07	6,172
Locke Ranch—Russell	33	25.06	6,496
Dean G. Stark	51	25.05	6,138
Locke Ranch—Russell	158	25.04	5,884

DISTRICT III — WOODLAND

Superior Photo 52

STANLEY ROONEY was top grower in District 3, with 36.73 tons per acre.

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Stanley Rooney	22	36.73	9,410
California Packing Corp.	64	36.37	8,408
S. Yamamoto	6	36.31	7,952
Robert Leslie Button	140	36.20	9,492
Orth Brothers	40	35.69	8,422
John E. Jackson	39	35.01	8,340
Dela Torres Brothers	36	34.74	8,644
C. Whealey	83	34.63	9,322
Kataoka Brothers	25	34.60	9,016
George Barry	165	34.60	8,830
Nishikawa Bros. & Fisk	110	34.48	8,848
John M. Dinsdale	7	34.44	9,718
*R. F. Malcolm, Jr.	95	34.32	9,082
Willis Hansen	22	34.30	7,594
Joe Gnoss, Jr.	25	34.30	8,802
Montgomery & Towne	43	34.25	7,070
Jacob Miller	15	34.15	8,100
Norbert Lammers	17	33.69	8,672
C. Strehle & Sons	32	33.69	8,288
Meek & LeMaitre	93	33.41	9,408
Henry Rehrman	111	33.38	9,112
Emmett Heidrick	26	33.34	8,896
S. Yamamoto	19	33.13	9,032
Robert C. Gill	98	33.11	7,986
Hamatani Bros. Farms	96	33.07	8,432
Pete Konitzer	96	32.95	8,738
Mas Oji	35	32.80	7,308
M. Barandas	71	32.75	8,096
Jack Perry	10	32.60	10,028
Shigaki Brothers	150	32.53	8,932
Mas Oji	38	32.47	7,636
William B. Schoeningh	33	32.44	6,260
Paul W. Reiff	38	32.43	7,750
F & F Beet Company	191	32.36	7,980
Elwood M. Olson	100	32.25	8,056
M. Romani	133	32.24	8,944
Edwin M. Ullrich	72	32.15	8,244
Wetzel Brothers	139	32.06	9,156
George M. Struve & Son	71	31.83	8,238
Erle E. Santens	130	31.74	7,712
Van Smith	149	31.71	8,492
Carl Storz	15	31.66	8,074
Fred Rehrman	95	31.61	8,970
C. Romani	72	31.58	9,146
Taxara & Machado	81	31.46	7,796
Howard Brothers	55	31.46	7,298
C. Bruce Mace	246	31.44	8,728
Carl H. Becker	118	31.44	7,408
M. Lewis	21	31.33	9,544
Carl M. Miller	27	31.31	7,432
Fred Bender	69	31.10	8,334
John J. Vanetti	46	31.06	9,412
Michael Merkley	19	31.04	9,032
Ralph W. Pollock	62	31.00	8,798
A. H. Rominger & Sons	62	31.00	8,792
Oji Bros., Uno & Terao	97	30.91	8,852
Nelson & Eveland	75	30.87	8,452
Allen Moore	74	30.86	7,492
California Packing Corp.	74	30.85	7,516
Dela Torres Brothers	93	30.80	6,894
Dela Torres Brothers	31	30.79	7,458
Frank Sakurada	20	30.58	8,458
Glenn Fry	30	30.50	8,228
Tsuji & Inouye	33	30.49	8,666
Johnston Brothers	20	30.47	8,112
Morita Brothers	15	30.40	8,634
Peter W. Schoeningh	24	30.38	7,516
Roy Holmes	86	30.18	9,236
Heidrick Brothers	53	30.14	8,572
Dela Torres Brothers	29	30.14	8,000
Elwood H. Blickle	39	30.12	8,320
Stanley Rooney	17	30.07	7,428
Carl H. Becker	131	30.06	6,536
Ralph Moss	20	30.05	9,154
Grimmer & Arcand	90	29.96	8,174
Norbert Lammers	5	29.91	8,184
C. M. Ordonez	75	29.89	8,842
Walter M. Rigney	113	29.87	8,012
Schneider, Fricke & Schneider	15	29.77	8,366
Nelson & Eveland	19	29.75	8,586
H. J. Eriksen & Son	108	29.72	7,180
Stanley G. Stinchfield	151	29.66	8,442
Tim Yoshimiya	24	29.65	8,390
Joseph Machado	52	29.63	6,892
Manuel Barandas	39	29.62	7,286
Richard Moore	94	29.60	8,258
C. H. Parella	30	29.37	8,888
C. H. Parella	21	29.34	9,030
Martin Brothers	111	29.32	6,550
Schneider, Fricke & Schneider	16	29.30	7,160
Manuel Jacinto	27	29.29	7,874
Stanley G. Stinchfield	8	29.27	8,852
Chew Brothers	44	29.26	7,708
Wilson M. Lovvorn	112	29.23	7,254
Alroy Vierra	18	29.22	7,680
Herota Brothers	59	29.21	8,068
Paul W. Reiff	101	29.20	8,206
Tash & Gomez	18	29.19	8,314
John Vanetti	43	29.13	8,424
Oji Brothers	27	29.12	8,364
Edwin M. Ullrich	94	29.10	7,170
Fred E. Rominger	20	29.10	7,572
M. Anchita	76	29.02	7,958
Paul Stephens & Son	55	28.95	6,636
Harlan & Dumars	100	28.95	7,324
Harry Gimenez	73	28.94	8,254
A. J. Rodgers, Jr.	31	28.94	8,120
James Brownell	6	28.90	7,578
Roy Hatanaka	32	28.90	8,000
Evergreen Farms	102	28.85	7,454
Morris Brothers	146	28.82	7,788
Thorley Brothers	114	28.79	7,496
University of California	4.2	28.69	7,637
Floyd E. Warner	57	28.65	7,358
Owen Farnham	22	28.61	7,330
A. L. & E. R. Reel	107	28.59	7,354
L. L. Peterson	23	28.52	7,398
Lloyd M. Eveland	150	28.51	7,350
George M. Struve & Son	234	28.47	8,126
William R. Lider	120	28.38	7,424
Heidrick Farms	45	28.37	7,842
F. J. Krehe	159	28.37	8,164
Louis Parella & Sons	323	28.35	6,980
Richard Wilson	21	28.34	8,632
Edgar Jang	51	28.30	8,376
Bruce Beeman	76	28.25	7,786
Buchignani & Hughes	74	28.23	7,210

*Deceased

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Tsuji & Inouye	36	28.23	7,442
M. G. Machado	49	28.16	7,186
Fred S. Tadlock	129	28.10	7,800
H. & R. Kodama	61	28.06	7,890
Eveland & Partain	118	28.03	8,224
Chuck Sakurada	28	28.02	7,526
M. Martinez	31	28.00	7,296
Glenn E. Morris	119	27.96	6,878
E. L. Comontofski	34	27.91	7,698
James Balsdon	20	27.83	7,420
Rosalind G. Criste	29	27.80	7,500
George Anderson	5	27.68	7,336
H. E. & Donald Helms	20	27.65	8,616
Leroy L. Leonard	203	27.50	6,710
Y. Aoki	53	27.48	7,128
K. L. Morris	113	27.41	7,122
Schneider, Fricke & Schneider	17	27.39	6,628
H. J. Eriksen & Son	38	27.37	7,522
Floyd E. Warner	31	27.36	7,328
R. J. Weyand & Son	42	27.34	7,764
Wilder Brothers	16	27.33	6,970
Henry M. Oji	73	27.30	7,732
Heidrick Brothers	86	27.25	7,608
M. & M. Bastiao	37	27.21	6,770
Paul W. Reiff	82	27.17	5,396
Heidrick Brothers	139	27.17	7,282
Richard K. Stephens	6	27.09	6,388
California Packing Corp.	302	26.93	6,792
Robert Rooney	23	26.88	7,262
Anack Carando	22	26.81	7,576
C. E. Frazier	65	26.81	8,226
Raycraft & Kilkenny Ranch	32	26.81	8,348

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
H T. Dodds	15	26.78	7,328
Wesley & Randall Reiff	35	26.78	7,412
James M. Campbell	32	26.76	7,460
Lloyd M. Eveland	154	26.74	7,418
Holden Scheiber Estate	6	26.70	7,502
Nelson & Eveland	29	26.68	7,706
H. L. Fredericks & Son	32	26.61	7,594
Morris Brothers	87	26.61	6,716
Heidrick Brothers	98	26.57	7,366
Howard Brothers	111	26.49	7,804
George Stephens	32	26.48	7,044
Wilson & Backer	152	26.48	7,996
Meek & LeMaitre	93	26.47	7,444
M. Neilson & Son	50	26.47	7,836
Edgar Everett	83	26.40	7,604
T. Mabalot	32	26.39	7,500
June Morita	26	26.30	6,476
Damsen Brothers	27	26.29	7,630
Erle E. Santens	36	26.28	6,124
David James Wilson	27	26.24	6,912
Fred Bender	25	26.23	7,192
Bruce Beeman	136	26.21	3,046
William E. Duncan	18	26.20	6,958
Haussler Brothers	103	26.19	6,186
G. A. Hanks	22	26.16	6,854
John J. Vanetti	145	26.12	7,668
Arnold Collier	104	26.10	6,676
Tsuji & Inouye	47	26.09	7,686
Kenneth E. Blickle	20	26.05	7,284
Schneider, Fricke & Schneider	37	26.05	7,424
Timm & Pistor	64	26.05	7,440
Gorman & Son	35	26.03	6,456
Fred Heidrick, Jr.	20	26.01	7,080

Grower	Acres Harvested	Tons Per Acre	Lbs. Sugar Per Acre
Frank Alvernaz	46	26.01	6,658
M. & M. Bastiao	23	25.98	7,088
Dixon Dryer Company	29	25.97	6,794
Hatcher Brothers	34	25.93	6,192
Donald P. Woolsey	31	25.92	6,740
Erle C. Warnken	42	25.92	6,842
Herota Brothers	52	25.87	7,436
Otto Strehle	22	25.85	6,798
Henry Rutz	78	25.84	7,126
E. A. & Glenn Watkins	34	25.80	6,378
Rosalind G. Criste	20	25.79	3,427
R. B. Moeller	29	25.76	6,192
Darrell T. Day	76	25.73	6,432
Johnston Brothers	42	25.67	7,064
Alice E. & E. J. Rogers	31	25.66	6,682
Glenn E. Morris	34	25.63	6,182
Carl Wiegand	25	25.56	7,560
Joe Gnos & Son	37	25.55	6,848
George M. Struve & Son	170	25.47	6,658
James M. Fulmer	154	25.46	7,342
Machado & Vieira	32	25.44	7,530
Orth Brothers	38	25.43	7,776
H. & H. Rominger	42	25.39	6,724
George G. Gross	13	25.33	7,538
Lloyd M. Eveland	35	25.30	7,338
Manuel Escano	19	25.27	7,546
Thorley & Daley	78	25.23	6,258
William Davis Struckmeyer	169	25.16	6,702
Tash & Gomez	18	25.15	7,384
Anderson Brothers	109	25.14	7,336
C. P. Morales	26	25.03	7,600
Rudy Howald	215	25.00	6,966

HARVESTERS HAVE NEW FEATURES

THE MANUFACTURERS of sugar beet harvesters are keenly aware of the need for constantly improving their products performance. Consequently, the design of harvesting machinery is in a more or less constant state of flux, so that it is only natural for certain minor weaknesses to develop as mechanical changes are made. It is to the distinct credit of the manufacturers that they acknowledge these weaknesses and take steps to correct them—and most cases at no charge to the owners of the machines.

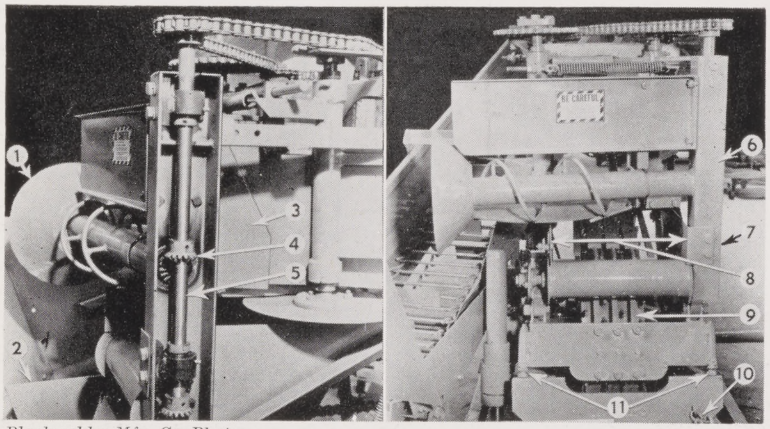
Last year, Blackwelder Manufacturing Company introduced the Marbeet Model "E-22" sugar beet harvester, which incorporated many changes from its predecessor, the "Marbeet Midget."

The 1958 spring harvest was one of the most difficult on record — soil, weather and weed conditions were unprecedented. Studying harvester performance under this adverse situation, Blackwelder engineers came up with a number of recommendations for improving harvester performance. The company incorporated these recommendations into a conversion kit which has been supplied, free of charge, to each owner

These refinements became standard in all machines in 1958 production, and the rigors of California's 1958 Spring harvest proved the worth of the new features.

The manufacturers of the Gemco Harvester are alert to the problem of soil and trash removal which has been a chronic problem with this machine. Their

(Continued on Next Page)



Blackwelder Mfg. Co. Photos

53

MARBEET HARVESTERS offer the folowing refinements for 1958:

1—Conical deflector on augur
2—Improved foliage shield
3—Wider beet deflector
4—Larger, tougher miter gears
5—Readily removeable shaft
6—Rigid augur and disk frame
7—Gears and bearings enclosed
8—Wider foliage passage
9—Improved stripper standards
10—New plow depth adjustment
11—New, easily accessible adjustment for spike-wheel height

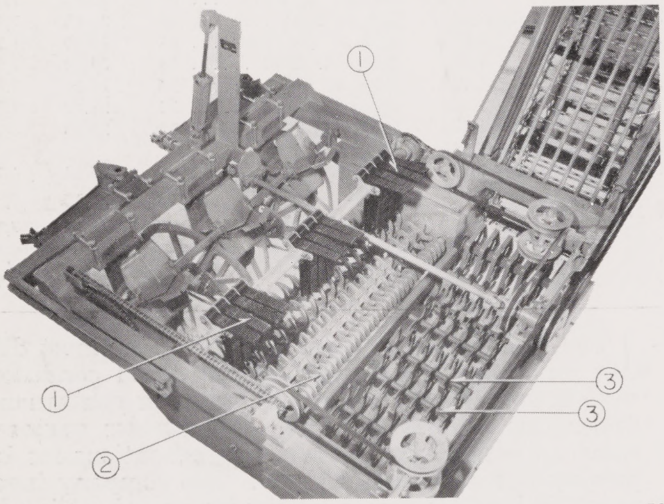
9

HARVESTER FEATURES *(Continued from Page 31)*

1958 models offer some rather important improvements directed toward elimination of dirt adhering to the beets, clods, and trash.

Rotating flails have been provided to "spank" the beets and remove adhering dirt. A reverse roll has been provided to intercept and remove trash such as weeds, beet leaves, weed roots, etc. Finally, cleaning cleats have been added to the final kicker rolls so that the latter are maintained clean and in operating condition in spite of muddy going.

A limited number of the Gemco disc toppers with pickup device will be put into California fields, but only on a pilot model scale this year.



Gemco Photo 54

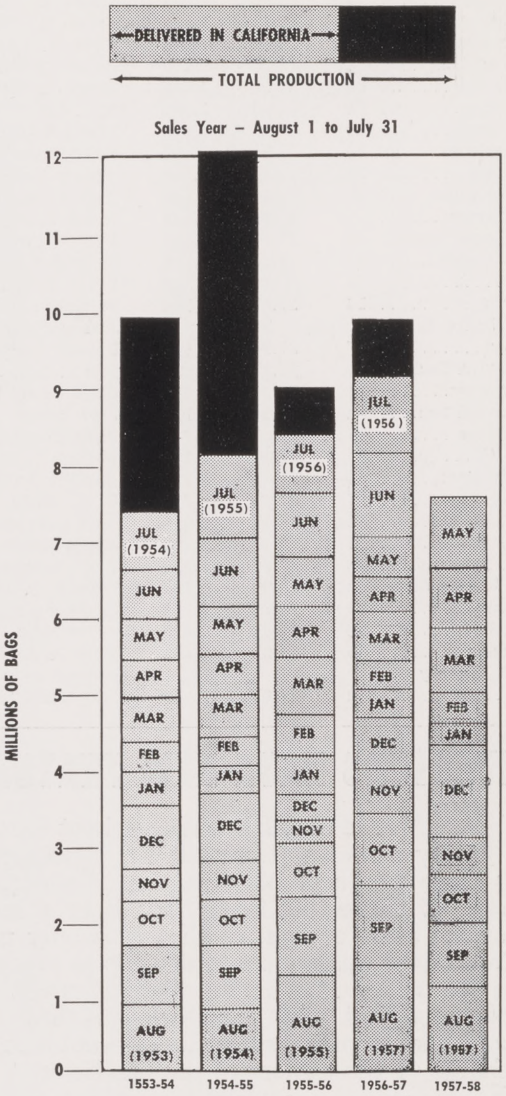
GEMCO HARVESTERS have been redesigned with emphasis on dirt elimination. New features include:

1, 1—Rotating rubber flails whip beets.
2 —Reverse roll removes weeds and trash.
3, 3—Kicker rolls have cleaning cleats.

The Farmhand Company of Hopkins, Minnesota, is in their second year of beet harvester distribution, having taken over the Oppel interests of Boise, Idaho. While the earlier Oppel machines were similar in many respects to the Gemco (they had the same common ancestor—Kiest), there has been considerable independent evolution.

Farmhand sugar beet harvesting equipment offered in 1958 features a tractor-mounted two-row disk topping device, mounted on the same tractor which pulls the digger-loader. This makes possible a "once-over" operation, employing one tractor and one driver.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



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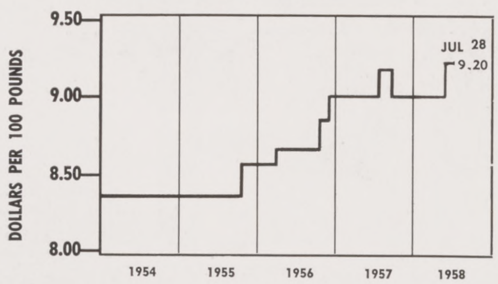
QUOTED PRICE OF BEET GRANULATED SUGAR

In 100 Lb. Paper Bags, F.O.B. San Francisco



The **SPRECKELS SUGAR BEET BULLETIN** is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers. Mention of specific methods, devices and implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.

AUSTIN ARMER, EDITOR SPRECKELS SUGAR COMPANY WOODLAND, CALIFORNIA

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SPRECKELS SUGAR BEET BULLETIN

VOL. 22 SEPTEMBER-OCTOBER, 1958 NO. 5

56

CONGRATULATIONS, CANNERS

Spreckels Sugar Company, and its growers salute the California Canning Industry on its hundredth birthday. We who produce sugar beets and beet sugar are mindful of the Canning Industry's importance as a user of beet sugar and of the many crops grown in rotation with sugar beets.

CANNERS CELEBRATE CENTENNIAL

IT WAS A BOSTONIAN, Richard Henry Dana, who in "Two Years Before the Mast" published in 1836 first described to a large American audience the broad variety of products that were to be found in then-remote California. To another Bostonian, Francis Cutting, belongs the credit for establishing in 1858 the industry that has made it possible for many of these products to be enjoyed all over the world: canning. This year California canners are celebrating their centennial, an event that calls to mind how important this industry is to both the state's sugar beet growers and sugar processors.

Cutting's headquarters were in San Francisco at Battery and Sacramento Streets, only three blocks from where the Spreckels Sugar Building now stands. There he canned peaches. These and other fruits and vegetables that were canned soon after were in brisk demand, first by the miners of the Comstock Lode and later by the U. S. Army in the Civil War.

In ensuing years, as more and more men turned from seeking precious metals in the mountains to farming the state's rich agricultural land, the output of farm products rose sharply to a level far in excess of local demand. With this rise in output there came an increasing interest in canned foods, because the completion of the transcontinental railroad made it practical to distribute large volumes of California products throughout the nation the year around.

California's canning centennial finds the state in unchallenged first place as the nation's largest canned-food producers, with an average yearly pack of about 217,000,000 cases. Included are fruits, vegetables, fish, juices, dairy products, soups—in all, more than 100 different kinds of foods. Together they amount to nearly one-third of the total canning production of the United States. Nearly every can of olives, peaches, apricots, figs, and fruit cocktail opened by the American housewife is grown and canned in California. About half of the total U. S. fruit, fish, sweet cherries, pears, asparagus, and spinach pack originates here. So do more than two-thirds of all tomatoes and tomato products. Thanks to these and other California canned foods, people all over the country and in many foreign countries are assured of a varied diet the year around.

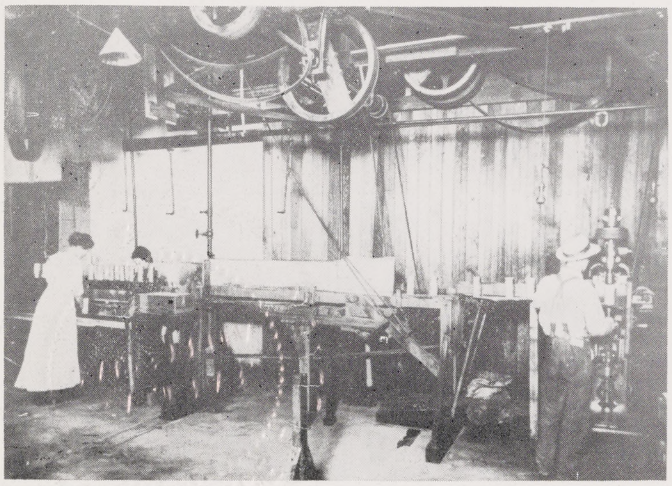
The impact of the industry's growth since Mr. Cutting opened California's first cannery in 1858 has had a major effect on California's economy. Today about 450,000 acres of California fruit and vegetable crops are harvested each year for the state's 375 canners and freezers. The 110,000 farmers, some of them readers of this article, and agricultural workers involved in producing these crops receive about $150,000,000 for them annually. During a typical season, 100,000 cannery workers draw paychecks totalling about $175,000,000. Altogether the annual value of California's canned food pack exceeds a billion dollars.

The canning industry is, as noted, of great significance to California's sugar beet growers and processors. For the processors it provides a home market for the tremendous amount of sugar required in canning fruit and a number of vegetables. It benefits beet growers in two important ways. First, the existence of the canning industry here makes it possible for beet growers to choose from a broad variety of crops in planning their rotation programs. Among them are:

Asparagus, Beans (Pinks, Whites, Kidney, Green, Garbanzos), Carrots, Corn, Garden Beets, Peas, Pickles (Cucumbers, Onions, Garlic, Dill), Potatoes, Pumpkin, Spinach, Squash, Strawberries, Tomatoes.

The canning industry also permits growers to plant larger acreages of sugar beets than they could without it, simply because processors here are able to contract for more acreage as a result of the heavy demand for sugar by California canners. Indeed, if there were no canning industry in California, it would be difficult for the state to maintain its position as number-one sugar-beet producer of the nation.

It is particularly appropriate, therefore, for the Spreckels Sugar Company and its beet growers to pay tribute to the state's canners on the occasion of their centennial and to wish them a fruitful second century.



Canners League of California photo. 57

THEN. In the early 1900's cannery operation was typified by steam-driven line shafts, leather belts and workers dressed in accord with the times, not the job.

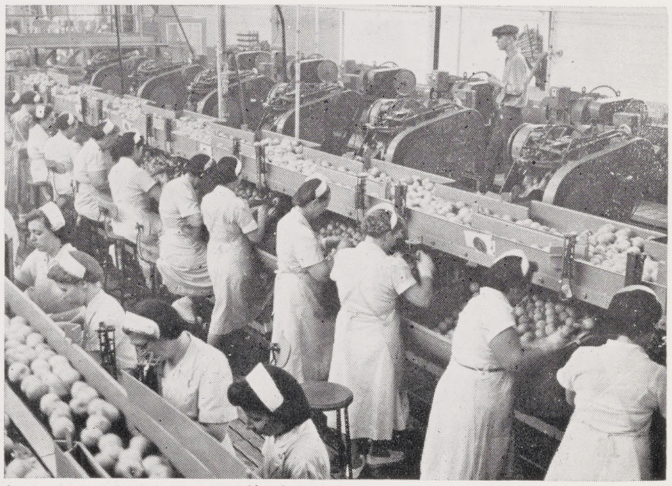


Photo courtesy of DEL MONTE SHIELD. 58

NOW. The Canning Industry is intensely mechanized—although more workers are employed, the productivity of each worker has been enormously multiplied.

59

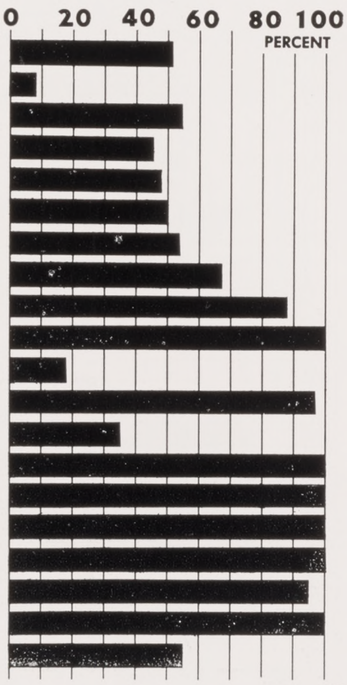
BEET SUGAR—either liquid or granulated—is a basic item supplied to the California Canning Industry by Spreckels Sugar Company.

62

OTHER CROPS—grown by Spreckels Growers in rotation with sugar beets —are purchased in vast amounts by the California Canning Industry

CALIFORNIA'S PRODUCTION of canned foods is an impressive share of the U.S. total, as shown by this tabulation of the twenty principal vegetable and fruit packs.

ITEM	CALIFORNIA'S Share of U. S. Total
Asparagus	50.6%
Green Beans	8.0%
Spinach	53.8%
Tomatoes	46.2%
Tomato Juice	48.1%
Tomato Catsup	49.7%
Tomato Chili Sauce	52.5%
Tomato Puree	67.0%
Tomato Sauce	87.8%
Tomato Paste	100.0%
Applesauce	17.8%
Apricots	96.5%
Sweet Cherries	36.2%
Figs	100.0%
Fruit Cocktail	100.0%
Fruits for Salad	100.0%
Ripe Olives	100.0%
Peaches	94.9%
Spiced Peaches	100.0%
Pears	55.0%



60

FIVE BILLION CANS (approximately) are filled every year with California's fruits, vegetables and fish.

Following are some field crops grown in rotation with sugar beets, and which are canned in California:

Asparagus

Beans (Pinks, Whites, Kidney, Green, Garbanzos)

Carrots

Corn

Garden Beets

Peas

Pickles (Cucumbers, Onions, Garlic, Dill)

Potatoes

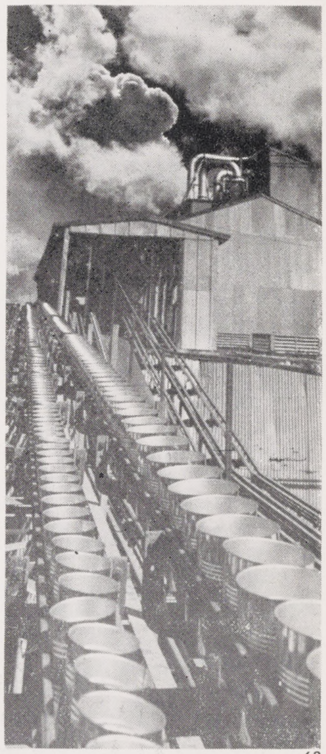
Pumpkin

Spinach

Squash

Strawberries

Tomatoes



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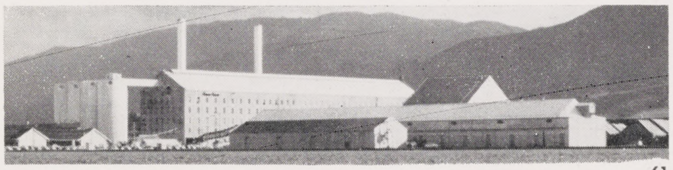


61

64

SOIL MOISTURE AND SUGAR BEETS

By R. S. Loomis[1] and L. D. Doneen[2]

OUR WESTERN AGRICULTURE depends on abundant supplies of water. Irrigation and the availability of water are so much a part of our life, we have come to accept them as common place, and our attention is often diverted to other problems. Superior sugar beet production, as obtained in the western areas, is due primarily to our ability to control and maintain available water and not necessarily to an over-emphasized arid climate.

HOW MUCH WATER?

In the interior valleys of California, sugar beets require a total of about 30- to 35-acre inches of water during the normal growing season. In Northern San Joaquin, Sacramento and Coastal valleys, a portion of the water will be supplied from that stored in the soil from winter rains. Water use increases in the warmer southern districts and Imperial Valley sugar beets may require as much as 40 to 48 inches of water. In open, well-drained soils, the sugar beet plant is deep rooted and is capable of extracting moisture to a depth of five to six feet. Only about half of total soil moisture in the soil profile is available to the plant. This available water is that which is held between field capacity and the permanent wilting percentage; for an average loam soil this equals six to seven inches of water in a five- to six-foot depth. If we began the growing season with a soil at field capacity, as a result of the winter rains or pre-irrigation, we must supply in addition, sufficient water during the growing season to equal the total required by the plant.

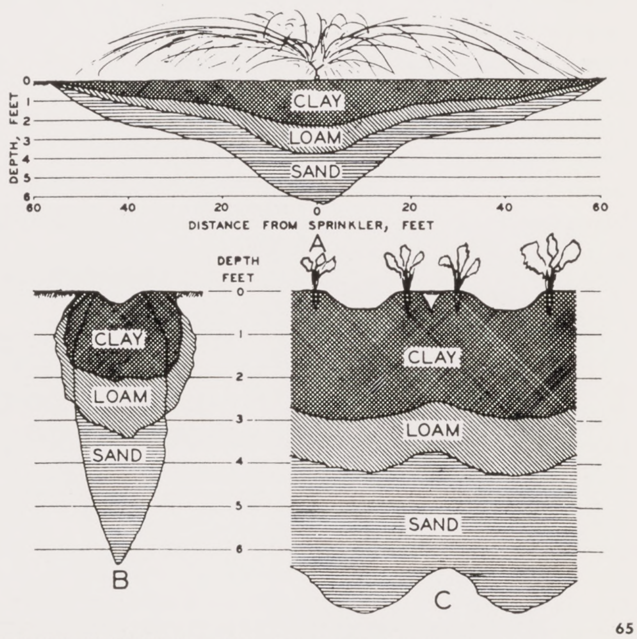
Date of planting has a considerable influence on the date of the first irrigation. Sugar beets planted in the Sacramento Valley in February or early March, with normal spring rains, will root to a depth of about three and one-half feet by May 15, before they reduce the soil moisture to the permanent wilting percentage. Thus, the first irrigation in early May may be relatively light, since only the moisture in the surface three feet of soil, need be replenished. If weather conditions are hot and without rain, or if the beets are planted later in the warmer season, then several irrigations are usually required during the first two months to prevent wilting of the leaves while achieving this same depth of rooting.

WHEN TO IRRIGATE

After the sugar beet has attained full root development to a depth of five-six feet, there ordinarily is no advantage in frequent light irrigations over infrequent heavy irrigations, except in heavy subsoil and high water table areas where root development is limited, and in the case of some unusual disease or pest situation, such as nematode. Irrigation should start when the plants have exhausted the moisture to about the last third of the available range. Large fields should be irrigated early enough so that the entire field can be covered before the soil approaches the permanent wilting percentage. Several devices, such as tensiometers and Bouyoucos blocks, are available for detecting the amount of available moisture remaining in a soil. These may be employed as a guide to irrigation or one may rely on experience and the appearance of the beet plants as an indication of the need for irrigation. Even with plenty of available moisture, the sugar beet plant will normally show some slight wilting or drooping leaves during the afternoon on hot dry days. If this condition is observed early in the day, before noon, or if recovery is slow in late afternoon as temperatures and light intensities decline, then the need for an irrigation is indicated. Droughty areas such as lighter soils, or where water penetration is poor, tend to wilt sooner than the rest of the field and may be used as indicators of the need for irrigating the entire field.

HOW TO IRRIGATE

Irrigation water may be applied to the crop by three different methods: (a) furrow, (b) sprinkler, and (c) subirrigation. In most areas furrow irrigation is the most satisfactory. However, sprinkler irrigation if often used on steep or rolling lands, on very sandy soil to prevent excessive deep penetration of water, in high water table areas, and on peaty soil. Subirrigation is only satisfactory on peaty or muck soils. By-and-large, most of the acreage in California is irrigated by the furrow method and the furrows are formed at planting or soon after thinning. If the sugar beets are planted on well shaped beds, the furrows are formed automatically, and this procedure will allow irrigation for germination and seedling establishment in dry weather. More uniform stands can generally be obtained in this manner than by any



WATER PENETRATION by different methods of irrigation on various soil types.

A.—Sprinklers give uneven distribution: hence the need for overlap.

B.—A single furrow between wide-spaced rows (such as tomatoes) may waste water, because penetration is greater downward than laterally.

C.—Bed planting (such as sugar beets), close to furrows, provides almost uniform lateral water penetration throughout the root zone.

[1]-[2] Assistant Agronomist and Irrigationist, respectively; University of California Agricultural Experiment Station, Davis.

other procedure. This is particularly important if the beets are to be machine thinned, since the essential ingredient for successful machine thinning is a uniform stand.

Irrigation practice may influence the availability of plant nutrients in the soil during the growing season. Low soil moisture may lead to poor root development, and to low nutrient uptake from that portion of the soil which has been dried by the roots. On the other hand, supplying more water than is required to wet a soil to field capacity to the maximum depth dried by the roots will result in leaching nutrients, particularly soluble nitrate-nitrogen, beyond the root zone. Thus, if the water is applied frequently, the irrigations should be light; infrequent, heavy irrigations should be somewhat less than the amount of available moisture held in five-six feet of soil (6-7 inches for loam). However, in wetting all parts of a field to the desired depth it is nearly impossible to prevent some deep percolation. With saline soils or poor quality water, some leaching may be desirable and then it may be necessary to use slightly higher rates of fertilizer.

IRRIGATION AND NITROGEN

High available nitrogen near harvest time is conducive to the continued vegetative growth of sugar beets. This prevents the plant from attaining a high sucrose percentage in the root. The question is often raised whether the adverse effects of high nitrogen can be reduced by altering the irrigation practice. Excessive water applied near harvest in an effort to leach some of the available nitrogen may be beneficial, but mid-season leaching is much more effective. Withholding water may reduce the activity of the roots in absorbing nitrogen but if the plant is allowed to wilt, growth, and hence the amount of nitrogen required by the plant will be reduced. Thus plants under moisture stress may remain at a high nitrogen status while showing an increase in sucrose percentage due to dehydration. A fall rain would easily upset this delicate balance. Research to date indicates that the benefit, if any, from such practices would be slight and a better solution would be simply to avoid supplying the plants with excess nitrogen in the first place.

Furrow (or sub-irrigation) may indirectly lead to high nitrogen at harvest time. With soils of high fertility and/or where nitrogen fertilizer has been applied, soluble nitrate-nitrogen will tend to sub to the top of the beds where it remains unavailable to the plants. Fall rains will then move this nitrogen into the root zone where the plants can absorb and utilize it for further vegetative growth. The result is a low sucrose percentage. Such surface isolation of nitrogen can be avoided or reduced by sprinkler irrigation and/or applying the bulk of the nitrogen early in the season.

In conclusion, one further comment might be made. Since sucrose percentage is expressed on a fresh weight basis, any desiccation of the root will give an apparent increase in sucrose percentage. If the desiccation is due to severe wilting prior to harvest, then photosynthetic activity of the plant and hence total yield of sucros may be reduced. There is some evidence that moderate wilting may slow the growth rate before reducing photosynthetic activity and thus slightly increase the real sucrose concentration in the root.

ABANDONMENT AND DEFICIENCY PAYMENTS EXPLAINED

By J. T. MOODY
Program Specialist, California ASC State Office

Editor's Note: There have been a number of requests from our field staff for clarification of the conditions which apply to Abandonment and Deficiency payments. Mr. Moody has very kindly prepared this article for the benefit of growers who may be uncertain of the law's provisions.

ALTHOUGH THE LEGISLATION authorizing conditional payments to growers of sugar beets and sugar cane has been in effect with only minor changes since 1937, some provisions of the law are still not clearly understood by growers. This is particularly true of the section of the law which provides for payments in connection with abandonment of planted sugar beets and deficiencies in production. In this short article we will attempt to clarify the procedure governing the approval of conditional payments by county committees in cases where all or a portion of the beet crop is abandoned or where the yield is less than normal.

ABANDONMENT PAYMENTS

As for abandonment, payments are authorized by the sugar law on the basis of one-third of the normal yield for the farm when the abandoned acreage qualifies for payment. To qualify the acreage for payment the grower must report to the county office his intention to abandon the acreage *before* the beets are destroyed or the land is used for other purposes. This is necessary in order to provide time for the county office to inspect the acreage to be abandoned and determine the cause for the abandonment.

No abandonment payment may be approved by the county committee, however, unless all of the following conditions have been met:

(1) The sugar beets were planted on land suitable for the production of sugar beets.

(2) The beets were cared for up to the time of abandonment or harvest, as the case may be, in a manner which could have been expected, under average conditions, to produce a normal crop of sugar beets.

(3) The abandonment or crop deficiency resulted directly from drought, flood, storm, freeze, disease, or insects.

(4) The acreage abandoned could not have been reseeded to sugar beets under conditions offering at least a fair opportunity for production during the crop cycle in which the original planting occurred.

No abandonment payment may be made on acreage in excess of the proportionate share at the time the abandonment is reported. This means that if a grower who is overplanted abandons acreage, even though it may be for a bona fide reason, the county committee may not approve payment for any acreage greater than the proportionate share. For example, if a producer with a share of 100 acres and a planting of 120 acres, reports the abandonment of 30 acres, he may, if the acreage is otherwise qualified, be paid for only 10 acres of abandonment.

DEFICIENCY PAYMENTS

Deficiency payments are authorized when the actual production of sugar beets in less than 80 percent of the normal yield established for the farm by the county committee. To qualify for payment, the deficiency must have been due to one of the causes listed above under abandonment. Where payment is approved it is made to the extent of the difference between the actual yield and 80 percent of the normal yield for the farm. In other words, if the deficiency in production is caused by one of the six bona fide reasons, payment is guaranteed on the basis of 80 percent of the normal yield for the farm. It should be noted particularly that a deficiency payment may not be made if any part of the deficiency resulted from improper care or through negligence of the grower. To explain, a crop may have been damaged by nematodes, but if the county committee determines that negligence on the part of the grower also contributed to the deficiency, no payment may be made.

Finally, we should point out that even though a farm has qualified for bona fide abandonment or crop deficiency in accordance with the procedure outlined above, payment cannot be made for such abandonment or crop deficiency unless the farm is located in an approved abandonment and deficiency area. Such an approved area is a county or a township in which, for the applicable crop year, due to bona fide abandonment or crop deficiency, the actual yields of commercially recoverable sugar were below 80 percent of the normal yields of the planted acreage either for 10 percent or more of the total number of sugar beet farms in the area or for those farms on which 10 percent or more of the total acres of sugar beets were planted in the area.

The procedure discussed in this article is taken from the County Sugar Beet Handbook which is used by county ASC offices in administering the sugar program. Growers who plan to abandon acreage or who have any questions with respect to abandonment or deficiency are urged to contact the local county office and obtain the necessary information.

66

THE WILD BEET — NEW CONTROL INFORMATION

By LAUREN BURTCH, *Agronomist, Spreckels Sugar Company*

THE EXPLORATORY PHASE of "wild beet" control was completed when field representatives of the Spreckels Sugar Company and the California Department of Agriculture analyzed test plot findings in Yolo County in July.

The "wild beet," a prodigal weed, infests public lands such as county and state highways, as well as farm lands; and in the beet growing areas of northern California the unobtrusive but steady spread of roadside infestations has become of increasing concern.

Because of this development the Spreckels Sugar Company, calling the attention of the State Department of Agriculture and several county departments of agriculture to the situation, pointed out that remedial help was needed in this community weed problem.

ACTION INITIATED

As a consequence, in the fall of 1955 a meeting was held at Yolo County Agricultural Commissioner Charles Hardy's office in Woodland to discuss an approach to the "wild beet" problem. Attending the meeting were representatives of the California Department of Agriculture, the Yolo County Department of Agriculture and the Spreckels Sugar Company. As a result of their discussion, the group recommended that: (1) the problem be publicized; (2) a community program be organized; and (3) herbicides for controlling the "wild beet" on crop and noncropped land be screened.

Following the Woodland meeting, the problem was publicized by a series of "wild beet" articles in the Spreckels Sugar Beet Bulletin, a sound movie produced by Sureckels Sugar Company, and by group discussions led by county and state agricultural officials and company personnel.

The prevention of spread of "wild beets" received attention from the Agricultural Commissioners of the older sugar beet producing districts, including Monterey, Yolo and San Benito counties where "wild beets" are established.

Cooperative trials were initiated in February, 1956, by the California Department of Agriculture's Bureau of Rodent and Weed Control and Seed Inspection and the Agricultural Research staff of the Spreckels Sugar Company. A heavily infested "wild beet" area along a state highway in eastern Yolo County was selected for the test plot site. A series of 22 non-replicated plots (each one square rod in area) were treated at various rates with six herbicides which showed promise of controlling "wild beets" along roadsides, industrial areas and in farm lands. In March, 1957, 12 additional plots involving three herbicides were established at the site.

CHEMICALS USED

For selective weed control along roadside and waste lands, best results were obtained with the low volatile

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MR. MURRAY PRYOR, Field Supervisor of Weed Control, California Department of Agriculture, initiated the work reported in this article. (See Spreckels Sugar Beet Bulletin, Nov.-Dec., 1955.)

ester of 2,4-D. For soil sterilization monuron (CMU), commonly known by the trade name of KARMEX W[1], proved effective.

Included in the trials for selective weed control were the amine and low volatile ester forms of 2,4-D, the amine form of MCP (2 methyl-4-chlorophenoxyacetic acid), and polychlorobenzoic acid. Amino triazole, 50% strength, [2] was applied as a contact systemic spray. Foliage sprays involving hormone-type herbicides were applied at concentration rates ranging from one pint to two quarts of stock material per 100 gallons of water. Treated plants were sprayed to wet. Amino triazole was applied at rates ranging from 2 to 16 pounds (gross material) per 100 gallons of water plus wetting agent.

Trials also included the use of the amine form of 2,4-D in massive dosages as a temporary soil sterilant. Acid equivalent rates of 10, 20, 30, 40 and 80 pounds per acre were applied in 1956. In the same year, soil sterilants of a more permanent nature were applied. These included KARMEX W at 10, 20, 40 and 80 pounds per acre; Ureabor[3] at 2.7 pounds per square rod or 430 pounds per acre; Chlorea[4] at 4 pounds per square rod or 640 pounds per acre; and DB-Granular[5] at 430 pounds per acre.

Of the selective herbicides used, low rates of 2,4-D amine and the low volatile esters of 2,4-D were effective in removing beet seedlings from other vegetation. Rates of 2,4-D at 2 quarts per 100 gallons of water killed seedlings and severely distorted seed stalks on old, well-established beets, thus preventing future contamination by a new seed crop. In this connection, the low volatile ester form of 2,4-D proved best.

Significant was the effect of contact systemic materials and soil sterilants on plant competition. The contact systemic sprays (amino triazole), killing all green vegetation, eliminated natural competition and encouraged "wild beet" reproduction. This was also true in the lower rates of the soil sterilants, especially in the second growing season after application. This type of treatment when used on fallow or non-cropped land is conducive to a bumper crop of seed from late germinating beet seed. Of the several soil sterilants tried, KARMEX W proved the most effective. Application rates of 20 to 40 pounds per acre resulted in complete sterilization for more than one year and 40 pounds proved effective for more than two years. The 80 pound per acre application, now three years old, is still 100 percent effective.

Although soil sterilants are highly effective for weed control along roadsides, ditchbanks and even spot treatments in farm lands, they should be used with care. The more insoluble forms tend to wander away from treated areas and may cause serious injury to trees and crop plants. Soil sterilization may also result in the erosion of roadsides and ditchbanks; however, these materials can play a most effective role when properly used.

In summary, the tests show that several herbicides can play a major role in retarding the spread of the "wild beet"; however, it should be remembered that chemicals alone will not suffice. Experiments show the most practical approach is the employment of a combination of methods such as chemical, mechanical and cultural.

ACKNOWLEDGEMENT

The author is indebted to Mr. Murray R. Pryor, Field Supervisor of Weed Control, California Department of Agriculture. Mr. Pryor not only spearheaded the experimental program described herein, but rendered invaluable editorial assistance in preparing this article.

WILD BEETS on roadside plot—no control. Seed production is enormous; spreading of the infestation is inevitable and rapid. Control of such severe cases is imperative.

LOW RATES of 2,4-D (low volatile ester) killed all weeds, but not their seeds. A year later (above) wild beets are again in evidence, but could easily be controlled by mechanical means (hoeing, etc.).

LOW RATES of soil sterilants destroy all vegetation, but not seeds. Here a thriving wild beet has emerged on previously sterilized soil.

67

HIGH RATES (80 lbs. per acre of KARMEX W) of soil sterilants are effective for three or more years after application, but may be more costly than a combined chemical and mechanical program.

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[1] A product of E. I. duPont de Nemours and Company.

[2] Weedazol of the Amchem Products Company, formerly American Chemical Paint Company.

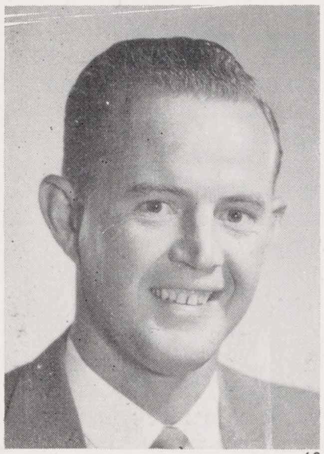
[3] A product of the Pacific Coast Borax Company, combining CMU and several borate compounds.

[4] A product of the Chipman Chemical Company, incorporating CMU, chlorate and borate compounds.

[5] A borate-2,4-D mixture of the Pacific Coast Borax Company.

Notes From Our Field Men

VERNON SHERWOOD, Spreckels:



68

"This season started without any unusual harvester modifications until mid-season. Then came a harvester man with a real idea.

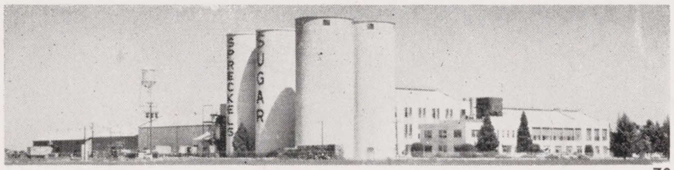
"Most truck drivers get their instructions for loading from the harvester operator through the addition of an extra side view mirror, or by turning their heads and looking out of the truck window. But not this outfit: they had a truck equipped with a periscope so the driver could look straight ahead and still get instructions from the harvester operator."

HARVEY PARKER, King City:

69

"Growers who really want to get their beets out in wet weather seem to be able to find ways to make their machines work. There is one 2-Row harvester working in a field near Greenfield so wet that the tractor cannot get traction. The grower has put a D4 on the front of the D6 to hold the harvester tractor straight.

"Growers are also finding that the potato chain foliage conveyors that most of them have put on their machines in the past couple of years will not work very well under wet conditions because there is too much dirt that sifts down through on the row that they are trying to harvest. Now they are cutting down old rubber trash belts and putting them over the chains; then they work very well."



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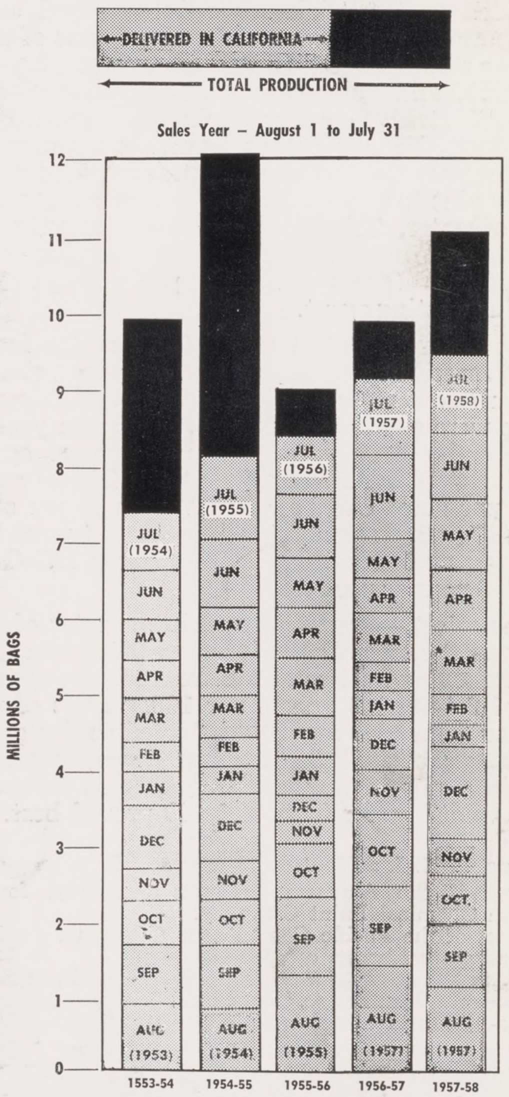
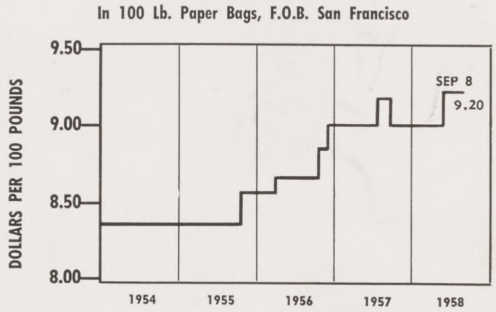
PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR



71

The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers. Mention of specific methods, devices and implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.

AUSTIN ARMER, EDITOR — SPRECKELS SUGAR COMPANY — WOODLAND, CALIFORNIA

PUBLISHED FOR CALIFORNIA SUGAR BEET GROWERS BY THE SPRECKELS SUGAR COMPANY

SPRECKELS SUGAR BEET BULLETIN

VOL. 22 NOVEMBER-DECEMBER, 1958 NO. 6

78

NEW DEVICES

This plot-harvesting truck is an example of the unique mechanisms designed and built by Spreckels for implementing research in

VARIETY IMPROVEMENT
WEED AND PEST CONTROL
FERTILITY AND IRRIGATION

and the many other projects which comprise the Spreckels agricultural research program.

MECHANICAL DEVICES ASSIST IN SUGAR BEET RESEARCH WORK

By DR. RUSSELL T. JOHNSON
Director of Agricultural Research
Spreckels Sugar Company

IN TODAY'S mechanized world, the hard jobs, from giant industrial operations to menial household chores, are done by machine. Agriculture is no exception — tractors have not only replaced the horse as a means of pulling power, but perform many other specialized jobs. In growing sugar beets, planting, cultivating and harvesting are now all done with mechanical aid.

Mechanical devices are manufactured commercially whenever the market for them is large enough to justify a tremendously costly research and tooling budget. But mechanical devices for research work fall into a different category. Research work is usually specialized, and many of the studies undertaken require mechanical devices that do not have wide enough application to justify their being manufactured on a commercial scale. Consequently, many of the machines used in research are adaptations of commercial products, or products that have been constructed specially for the specific job to be done. Some of the mechanisms devised for doing certain research jobs are as ingenious as the solution of the research problems themselves.

MECHANIZING PLOT HARVESTING

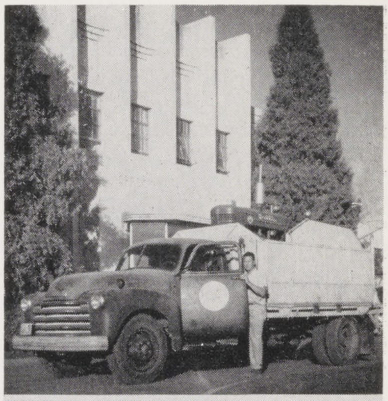
Among the most interesting of the mechanisms we have devised is a sugar beet plot harvester. Field plot work in our experiments is carried out to determine yield differences between our varieties, or between fertilizer practices. Our plots are usually small in size, and are located in all of the areas in which Spreckels Sugar Company contracts sugar beets. Both of these factors make difficult the use of a large commercial sugar beet harvester. In the past, harvesting these plots consisted of plowing out beets with a plow, usually provided by the grower, on whose farm the experiment was being conducted. A crew of men was then hired to top the beets and lay them along on the rows where counts could be made of the beets and notes taken on the roots. Then samples were taken for sugar and other chemical determinations. The next operation consisted of picking the beets up into some kind of container so that they could be weighed. Finally, they were hand-loaded into a truck for hauling to a receiving station.

As the commercial beet harvest changed from hand harvest to machine harvest, plows satisfactory for lifting sugar beets became scarce, and we began transporting our own tractor with its mounted plows to the different plots.

In addition to the problem of plowing the beets, field labor for harvest crews seems to become more and more scarce each year. The accumulation of these problems spurred the quest for an experimental plot harvester that was precise enough to harvest the small areas of sugar beets encompassed by the plot, rugged enough to plow the beets, and yet mobile enough to be moved long distances in a short time.

The problem was solved by the joint effort of our

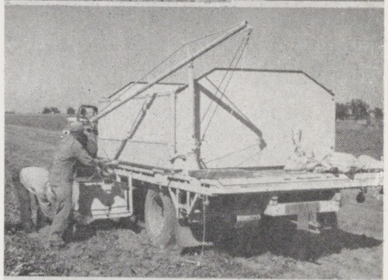
MECHANIZED SUGAR BEET PLOT HARVESTING



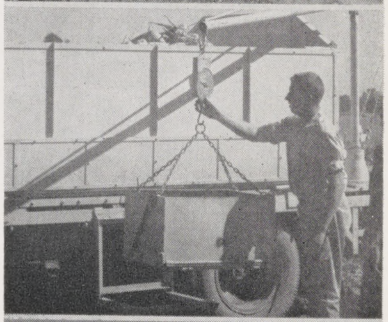
CHARLES CARLSON starts from his Woodland headquarters with the new self-contained plot-harvesting unit.

LEFT — tractor, with topper and plow goes to work in the field where the plot is located, which may be as much as 300 miles from headquarters.

RIGHT — topping disk of modified International Harvester topper removes crown and foliage; deposits them in furrows. Rear-mounted plows then lift beets.



BEETS are counted and tossed into hopper alongside truck.



HOPPER is lifted off its perch; scale indicates weight of beets.

CRANE, operated by truck power take-off, lifts hopper high over truck bed; bottom is tripped and beets fall into the truck. Beets are then hauled to the nearest Spreckels receiving station for credit to the co-operating grower's account.

Agricultural Department staff members. The Sacramento Implement Yard mechanics unravelled the skein of ideas presented to them and built the equipment which is illustrated and described at the left.

PLANTING VARIETY PLOTS

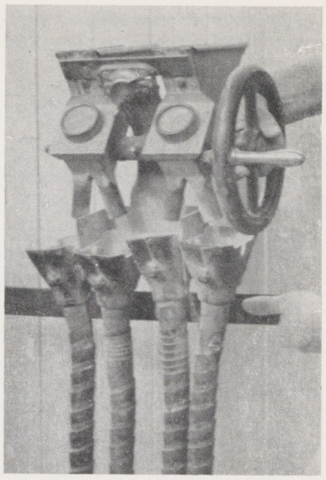
Variety plots usually consist of single- or two-row strips of each variety, from forty to sixty feet long, and with several replications in a field. The purpose of variety trials is to compare the performance of the different varieties under actual growers' conditions. It is from these trials that we determine which new experimental varieties will be increased for commercial use to supplant current commercial varieties. Thus it is essential that a precise test of the performance of these varieties be determined. In a grower's field, planting by hand is often not practical even in the small plot areas. The reason is that the row sometimes can not be made straight enough to prevent damage to seedlings by subsequent cultivation. Therefore, it is almost essential that planting be done on a sled, or by the planter used to plant the rest of the field. For many years the planting of these variety trials was done by placing the experimental seeds in the cans on the planter. Then at the ends of each plot the cans were moved to different planter shoes, or the cans would be emptied and refilled with the desired varieties. This operation had some drawbacks. It led to a small amount of mixing of the seeds. It also was a time-consuming process in the field, and delayed the tractor driver.

In our search for a device that could be satisfactorily used in assisting this planting operation, we observed devices being used by other research groups. One of these consisted of a metering device turned by a hand crank which fed the seed into ribbon tubes attached to the shoes of the planter. With some minor adaptations of his own, one of our staff members made up the first of two metering units. It is designed for planting two-row plots in areas where beets are commonly planted on two-row beds. The second was made by a mechanic in the Sacramento Implement Yard. It is made up as a series of four single metering devices, operated in tandem, and which can be used on either single or double row plantings. The advantage of this device is that the seed can all be packaged in small containers in our seed laboratories and transported in sealed containers to the field where just the right amount for each plot is put into each meter box and used to plant the plot. This reduces the possibility of error and speeds up the operation in the field. We have been well pleased with the use of this machine.

PLANTER STUDIES

In the development of monogerm varieties, it has become of interest to study precision planting. Many things affect the precision with which sugar beet seed can be distributed down the row. Some of these are type of planter, size of opening through which seed must pass, speed of the tractor which propells the planter, size and shape of the seed, and several others. In studying the effects of these various factors, it became necessary to have some method of holding all factors constant except the one being studied. To do this, one of our staff at Spreckels built a frame on which planter units of different types could be mounted. The drive for the planter units was supplied by a small electric motor, combined with a variable speed transmission. Simulated speed of the tractor could be calculated from tachometer readings. The device was assembled, and works very well right in the seed laboratory. It evaluates the different types of planters, different sizes of openings in the plates, different seed size and different planter speeds as they influence the precision of planting beet seed.

PLOT PLANTING is facilitated by this Spreckels-designed seed metering unit which quickly attaches to a conventional planter in the co-operating grower's field.



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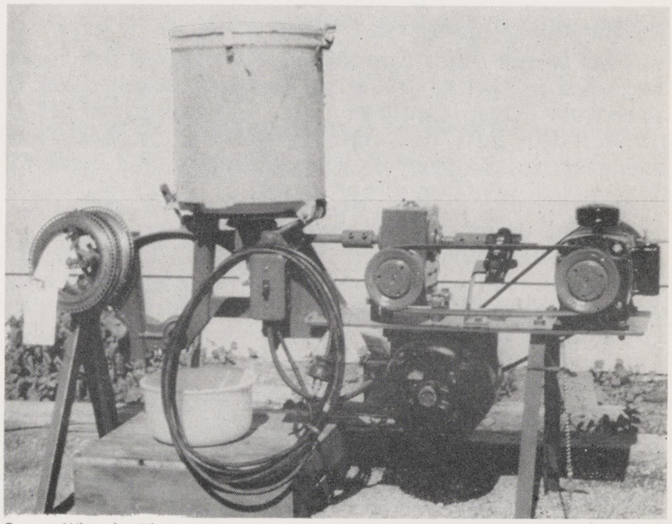


George Wheatley Photo 81

PLANTER PERFORMANCE with processed seed is periodically checked in this machine, which simulates field operation of any selected planter make.

In a program of developing new varieties of sugar beets, many experimental strains are produced in an attempt to develop something better than is now available. In the early stages of development of these experimental varieties, only very small quantities of seed are produced. Some convenient method for cleaning this seed was sought. Beet seed is round and will roll very well. For that reason it appeared that a small draper or carpet type cleaner should be satisfactory in separating the seed of the sugar beets from the pieces of sticks and trash that were included in

the harvested seed. A small canvas covered draper was built for this purpose and works very well for small lots of seed.

WEED CONTROL

A subject of considerable interest in the past several years has been that of chemical weed control. The ideal chemical for weed control in sugar beets would be a substance that could be applied to the field which would inhibit or retard the growth of weeds without any appreciable damage to the sugar beets. Such an ideal chemical has not yet been found, but the search is on. As new chemicals that have a potential use as weed control agents in growing sugar beets become available, we attempt to evaluate them in the areas where they appear to have the most promise. These areas are scattered throughout our beet growing districts. The need arose for some kind of a device that we could use to maintain pressure and get adequate coverage of the desired areas, using the various available materials as sprays. Whatever we used also had to be highly mobile, so that it could be transported long distances without difficulty.

We presented the problem to our Agricultural Engineer. He designed a road-worthy trailer carrying a spray tank, engine-driven pump, and an adjustable tool bar which would carry not only suitable spray nozzles, but furrowing tools or shields for selective spraying. A wide pressure range was provided, as well as suitable gages to indicate rates and pressures. Construction of this very useful tool was carried out in the Sacramento Implement Yard.

This is one more example of the devices developed and used in the Agricultural Research Department of Spreckels Sugar Company in a continuing effort to provide the best possible information, methods and materials to the growers who produce sugar beets for Spreckels Sugar Company.

But let us emphasize that such devices do not, by themselves, make a research program. They are the tools that help to build a profitable sugar beet agriculture—they serve to implement a coordinated program of applied research.

82

CHEMICAL WEED CONTROL investigations are made with the help of this Spreckels-built spray-applying trailer.

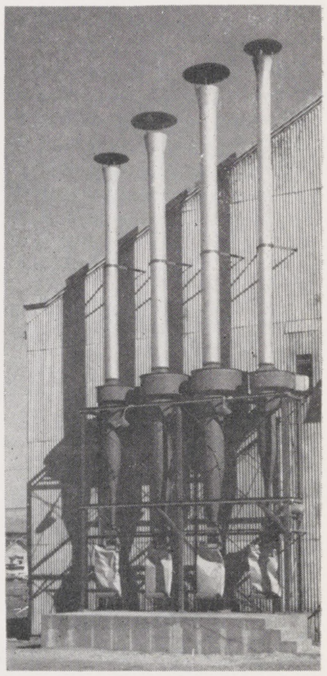
SPRECKELS SEED PROCESSING OPERATIONS CONSOLIDATED

SINCE 1942, the processing of sugar beet seed issued to Spreckels growers has been done at two plants, located at Spreckels and at Woodland. As the complexity of processing increased through the years, these plants grew correspondingly in equipment and man-power.

Early in 1957, Spreckels Sugar Company management made the decision to consolidate the Spreckels and Woodland seed processing stations in order to insure maximum uniformity of product, centralized quality control and more efficient distribution of processed seed. Consequently, the Woodland seed processing plant was dismantled, transported to Spreckels, and rebuilt as a part of a new and enlarged facility. The original Spreckels installation was modified for coordination into the new plants. To dispose of dust created by the enlarged plant, an entirely new dust removal system was designed, built and installed. There is now far less dust emanating from the enlarged plant than from its smaller predecessor.

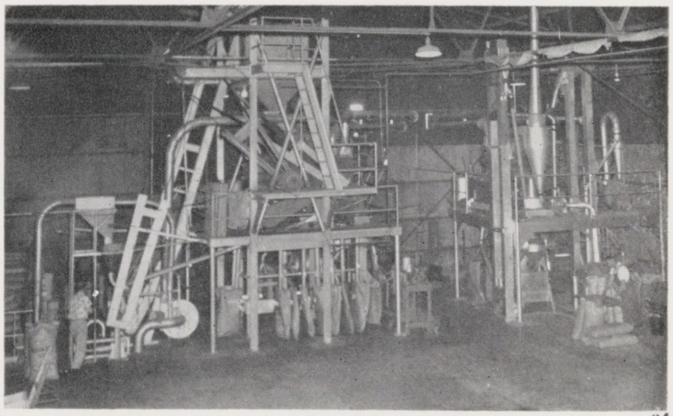
Handling of the increased volume of seed (over a million pounds annually) is facilitated by a new bag stacker and conveyor.

Warehousing of processed seed will continue at Woodland and Manteca, and the issuing of seed to growers will continue, as it has in the past, through the agency of the Field Superintendents.



83

IT'S IN THE BAG—dust and chaff are collected and bagged—air discharged from the stacks is pure, and does not contribute to air polution.



84

NEW SEED PROCESSING station at Spreckels now includes the facilities formerly in use at Woodland.

SUGAR CONTENT VARIATIONS DURING THE 1958 FALL HARVEST

By GUY D. MANUEL
Vice President and General Agriculturist
Spreckels Sugar Company

SUGAR CONTENT has probably been discussed more this fall than ever before in the history of the beet sugar industry. There have been reports from many areas of beets testing 9% to 11% sugar.

However, the picture is not quite as black as may have first been painted. Let us look at the charts at the right. Chart 1 shows the average sugar content (by weeks) for all growers harvesting for Spreckels Sugar Company in the Sacramento Valley. You will note that the solid line which represents the 1958 crop has crossed the dotted line, which represents the four year average for this area. This means that the sugar content for the beets being harvested in November of this year is actually higher than the average of the previous four years.

Just what are the explanations for the unusual behavior of sugar content in these 1958 beets in this area? There is little doubt in our minds that the extremely wet spring and above average temperatures of July and August were main contributing factors. These conditions made what appeared to be ideal conditions for disease and insect infestations. Leaf spot, a fungus disease that affects the leaf surface and interferes with normal growth, was widespread in many of our growing areas this past season. Normally this disease is confined to the humid areas east of the Rockies. There it is adequately controlled by resistant varieties. If this disease continues to be a problem in our growing ideas, its effects can be minimized by resistant varieties which could be made available in a short time.

From studies conducted this year we know that any field having leaf spot was low in sugar content and it was also noted that even with the general increase in sugar content through October and November that these fields did not gain in sugar content nor in yield.

In past years it was felt that virus yellows might be the most serious factor involved in depressed sugars, but this year no good correlation could be made between the two.

In the San Joaquin Valley (Chart 2) we have a picture somewhat similar to the Sacramento Valley, except that the 1958 sugar content does not come up to or pass the four-year average. It does, however, exceed 1957 crop figures. In this area leaf spot was also a factor, even as far south as Kern County. Virus yellows was also prevalent in this area, but still on the average, sugar content will be better than last year.

The Salinas Valley has a much different picture as shown in Chart 3. Sugar content started low and held the same general pattern as the previous averages. It is most difficult to explain this situation, as disease and other troubles appeared to be at a minimum. Yields (tonnage) were the second highest on record for the district, yet there is still the lowest sugar content on record. One apparent explanation is shown in Chart 4, which shows the 1958 weekly average temperature as compared to the average for the previous

(Continued on Page 48)

CHART 1

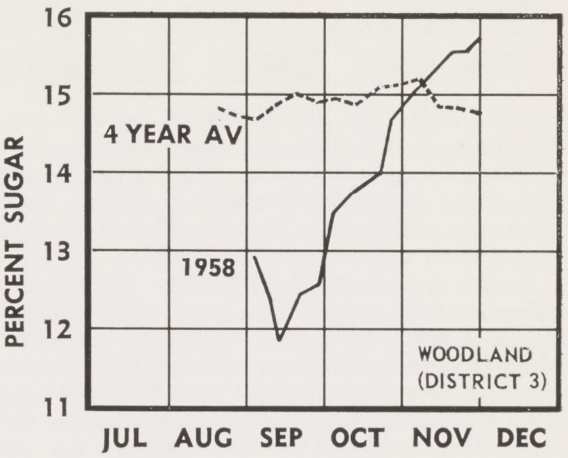


CHART 2

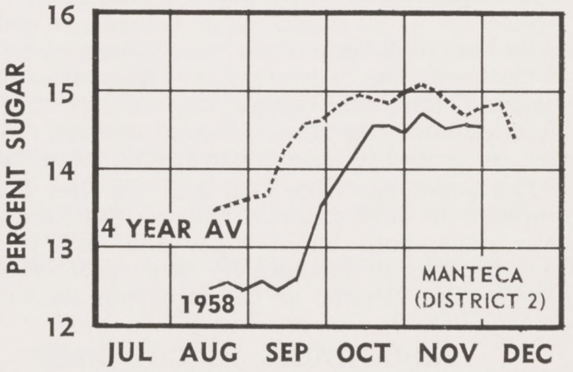


CHART 3

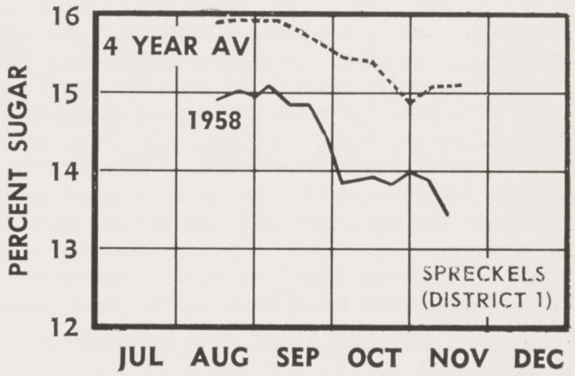
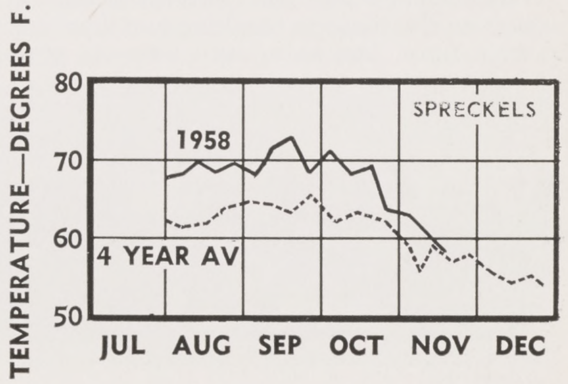


CHART 4



85

SPRECKELS EXPANDS FACILITIES FOR BULK SUGAR DISTRIBUTION

PICTURED ON THIS PAGE are a number of facilities that Spreckels Sugar Company has built or purchased in the last year. Dissimilar in appearance, they share a common purpose: to enable the company to handle and distribute more efficiently sugar in bulk form—both liquid and granulated.

Today Spreckels' facilities for handling and distributing bulk sugar include storage bins at each of its three factories with a combined capacity of 100,800,000 pounds of sugar (63,890,000 pounds of this capacity have been added in the last two years), related equipment for conveying and loading bulk sugar, production facilities at each factory for the manufacture of liquid sugar, six liquid sugar trucks and six bulk sugar trucks. In addition, contract truckers furnish up to 30 liquid sugar trucks and seven specially-built bulk granulated trucks at certain seasons of the year. The company has a fleet of leased liquid sugar rail tank cars varying from 30 in winter to over 65 in summer. As many as seven covered rail hopper cars are needed to serve our bulk granuated customers.

Ten years ago Spreckels was the first beet-sugar processor to offer sugar in bulk on the Pacific Coast. Ever since, both liquid sugar and bulk granulated have become an increasingly large part of the company's sales volume, as the foregoing statistics indicate.

ADVANTAGES TO CUSTOMERS

One reason that sugar in bulk form has found favor with industrial users like bakers, bottlers, canners, confectioners and ice-cream manufacturers, is that it eliminates costly handling of bagged sugar. Instead of unloading, stacking, and later rehandling 100-pound bags of sugar by hand or by fork-lift truck, industrial users with liquid or bulk granulated sugar installations can discharge sugar mechanically from rail cars or trucks and either store it or put it directly into process.

Other economies of sugar in bulk form are that the user may obtain sugar at lower prices, since there are no bagging costs, and that sugar losses are reduced, since spillage of liquid or bulk granulated sugar is easier to prevent than breakage of paper bags.

ADVANTAGES TO COMPANY

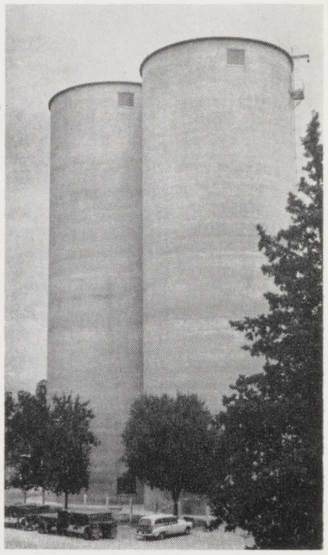
The company also has obtained important advantages from the trend to handling and distributing sugar in bulk form, and so in turn have its growers. The cost of warehousing bagged sugar, both at the factory and in public warehouses, has risen sharply in recent years, hence storing granulated sugar in bulk for later delivery in bagged or bulk form has proved to be financially attractive. Bulk storage bins at the factories provide another economy by eliminating the need for cutting bags of sugar to make liquid sugar or to fill bulk trucks or rail cars.

Warehousing and bag-cutting costs are among the items deducted from the gross selling price in the computation of the net selling price on which payments for sugar beets are made. The reduction of these costs that has been made possible by handling and distributing sugar in bulk form has improved growers' returns from sugar beets.

FUTURE EXPANSION

The future should witness further expansion of bulk granulated and liquid sugar sales. For not only are more and more customers taking advantage of the economies that sugar in bulk offers; but

(Continued on Page 48)



86

BULK BINS were completed this summer at Manteca.

T. B. Green Photo

87

THIS BULK GRANULATED sugar trailer hauls 40,000 pounds of sugar—delivers it to customer's elevated bins by means of its self-contained gasoline engine-powered blower. It can discharge its 40,000 pound cargo in just one hour.

T. B. Green Photo

88

SPRECKELS' newest stainless steel tank trailer hauls 4,300 gallons (46,000 pounds) of liquid sugar. Concealed in the rear compartment is its own engine driven pump which can deliver the load to a customer's elevated storage tanks.

A SUMMARY OF THE 1959 PROGRAM OF PROPORTIONATE SHARES

WHILE SPACE does not permit discussing in detail all the specifications for establishing proportionate shares in California for 1959, most of our growers fall in the old producer category. They have produced beets in one of the years of the base period, and allotments of acreage for the majority will be clear-cut. But all growers who experience problems with their allocation are urged to contact their headquarters county A.S.C. office for clarification, adjustment and/or appeal. While it is too early to estimate the size of individual proportionate shares, it is believed that initial allotments will be reasonable close to those issued in recent years.

The *initial* allocation for 1959 crop sugar beet acreage in California is 201,119 acres. A comparison with previous years is here tabulated:

1959 - 201,119 (initial)
1958 - 213,505 (initially 200,503)
1957 - 206,051
1956 - 182,430

The California acreage goal for 1959 has not yet been divided between northern California and Imperial Valley. Last year the northern section of the state received 157,277 acres, while the Imperial Valley area received 43,226 acres to total 200,503. The national planted acreage goal in 1959 is 925,000 acres. This is 10,000 acres larger than initially issued in 1958 and 25,000 acres less than 1957.

FARM BASES

In 1959 the base period has been moved forward to include the crop years 1955 through 1958. As in previous years, the initial proportionate share allocation to beet producers will be made by applying a factor to the farm base. For old producers who are tenants the farm base will be the larger of (1) the 1955 through 1958 personal average accredited acreage, or (2) the 1955 through 1958 landowner's average share. In the case of a landowner who is not a tenant on any land the farm base is the four-year average of the landowner's share of the crops during the base period.

A former new producer, or a tenant operator for whom a new-producer share was established in 1956, 1957 or 1958 will receive a farm base which will be the larger of (1) his accredited acreage for the period divided by four or (2) the landowner's share of the history for the years, 1955-1958 on the farm he will operate in 1959, but not to exceed the share established for his 1958 farm. If the former new producer is the owner-operator of a farm for which a new producer share was established for such owner-operator in any year subsequent to 1955, the 1959 farm base shall be the larger of (1) 25% of the farm's total accredited acreage (1955 through 1958) or (2) the 1958 crop accredited acreage of the farm. In either case, it will not exceed the 1958 crop share for the farm.

Unusual cases are covered in the regulations. These may include death or incapacity of a grower, merger or consolidation of individuals or corporations and loss of land to any agency or entity having right of eminent domain. Growers who have these or other unusual problems concerning proportionate shares are urged to discuss their particular circumstances with their headquarters County A.S.C. committee.

The state committee has determined that personal history shall be used in establishing proportionate shares for sugar beet growers who are tenants. Where such tenant is operating land which itself has an accredited acreage record, that landowner's share of this acreage may be used if it is larger than the tenant's personal accredited acreage. Tenants will continue to receive 100% of the accredited acreage history for sugar beets produced or abandoned by them for eligible cause. Personal history may not be transferred except as provided for in unusual cases.

PARTNERSHIPS

To receive a proportionate share as an operator-producer, a partnership must meet the following requirements:

1. Each partner must contribute land, water, labor, equipment, financing or some other requirement besides proportionate share history or "supervision."
2. Each partner must share in control and direction of the operation of the partnership.
3. Each partner must share on a percentage basis in the profits or losses of the sugar crops produced by the partnership.

In formation of a partnership personal history may be brought in by an individual provided the history was earned prior to the formation of the partnership and provided all his history is contributed. History may not be divided between the partnership and an individual's separate operations.

In dissolution of a partnership within five years of its formation, history would be withdrawn according to the original contribution of the respective partners. After five years, upon dissolution, personal accredited acreage may be distributed on the basis of written agreement signed by all partners.

NEW PRODUCERS

Allocations of acreage to new producers (those having no usable acreage history, personal or farm, during the base period), will probably depend upon the total acreage requested by such producers within the county. A new producer will be asked to indicate the minimum acreage he will plant if the full request cannot be granted. In addition, the A.S.C. committees will expect assurance that there is available land on the farm for which shares are requested, that irrigation water is available, that the land is adequately drained, and that the farm site is in an area served by a processor. Because of limited acreages available to new producers, the recommended share should be limited to the lesser of 25% of the land or 25 acres.

The tenant grower who produced beets during the base period, and who becomes an owner-operator on land with no history (thus becoming a new grower), will receive special consideration and shares in keeping with his past operation.

In conclusion, it must be emphasized that in California, a "Beet Grower" or a "Farm" may be a complex structure, and that compliance with the Proportionate Share Program may require close study and assistance from the County A.S.C. Office.

SUGAR CONTENT

(Continued from Page 45)

four years. The increased temperatures could have had a very definite effect on sugar content.

The most difficult thing to explain is the difference between fields in the same location. We can hardly blame the seed variety when one grower gets 15% beets and another across the road gets 11%. Equally puzzling is the 16.4% average for an entire district. However, we feel that if we can get the answers to situations such as these we will then know a lot more about some of the specific determinants of sugar content.

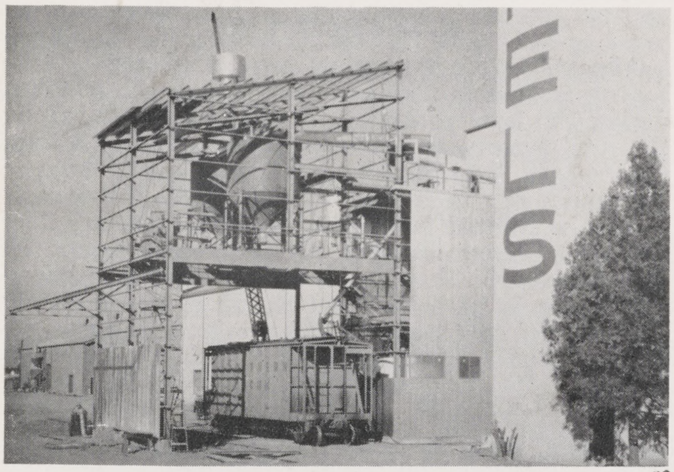
To gain sufficient information about the problems involved from field to field we are conducting a very careful survey of fields that have these variations in sugar content. Leaf and root samples and weight are being taken periodically and analysed. Cultural practices are being studied, particularly as they relate to irrigation and fertilization.

We feel that such a program will give us some leads toward a better understanding of sugar content and allow growers to modify practices to get high sugar content. How soon we will have the answers is still a matter of speculation but growers can be assured that the Spreckels Sugar Company is doing everything possible to expedite the program.

BULK SUGAR

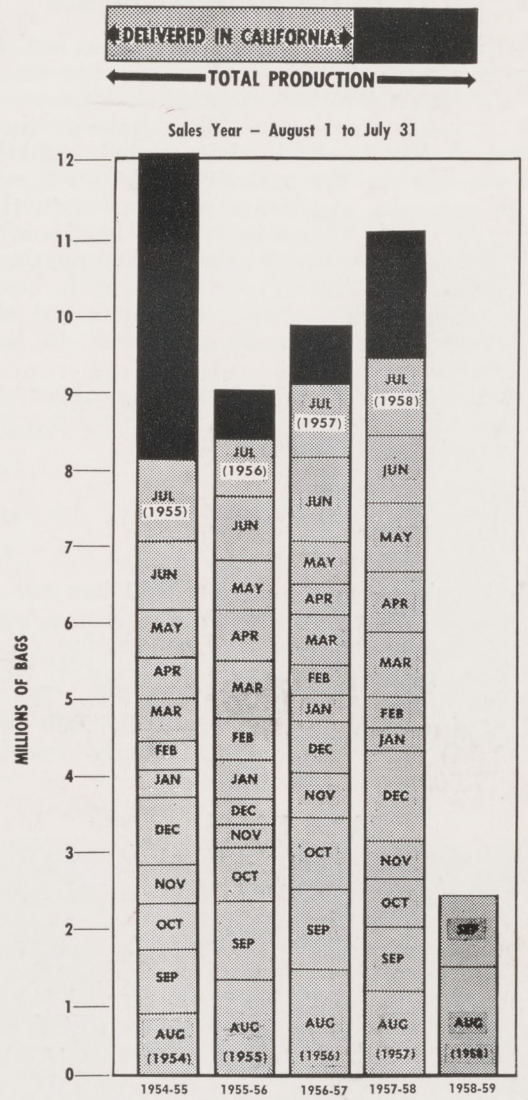
(Continued from Page 46)

also total industrial sugar usage has been growing in California. The rising population of this state plus the many advantages of locating industry here have caused, and should continue to cause, existing food-processing plants to expand and new ones to spring up here. This should accelerate the trend to sugar-in-bulk usage that has proved beneficial to customers, processors, and growers.



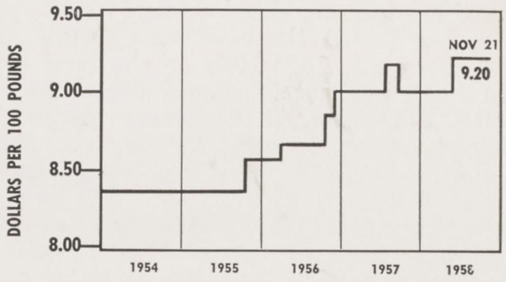
NEW BULK SUGAR loading station is under construction at Woodland. Included are liquid sugar melters, granulated sugar weighing bins and facilities for loading liquid or granulated sugar into rail cars or trucks.

PRODUCTION AND DELIVERIES OF BEET SUGAR IN CALIFORNIA



QUOTED PRICE OF BEET GRANULATED SUGAR

In 100 Lb. Paper Bags, F.O.B. San Francisco



The SPRECKELS SUGAR BEET BULLETIN is issued bi-monthly by the Agricultural Department of the Spreckels Sugar Company as a service to its growers. Mention of specific methods, devices and implements does not constitute an endorsement by the Company.
All photographs by the editor unless otherwise indicated.

AUSTIN ARMER, EDITOR — SPRECKELS SUGAR COMPANY — WOODLAND, CALIFORNIA

INDEX TO VOL. 22, 1958